

Network

Railways of Australia Quarterly

Volume 23, No. 2

April, May, June 1986

Price: \$2.50

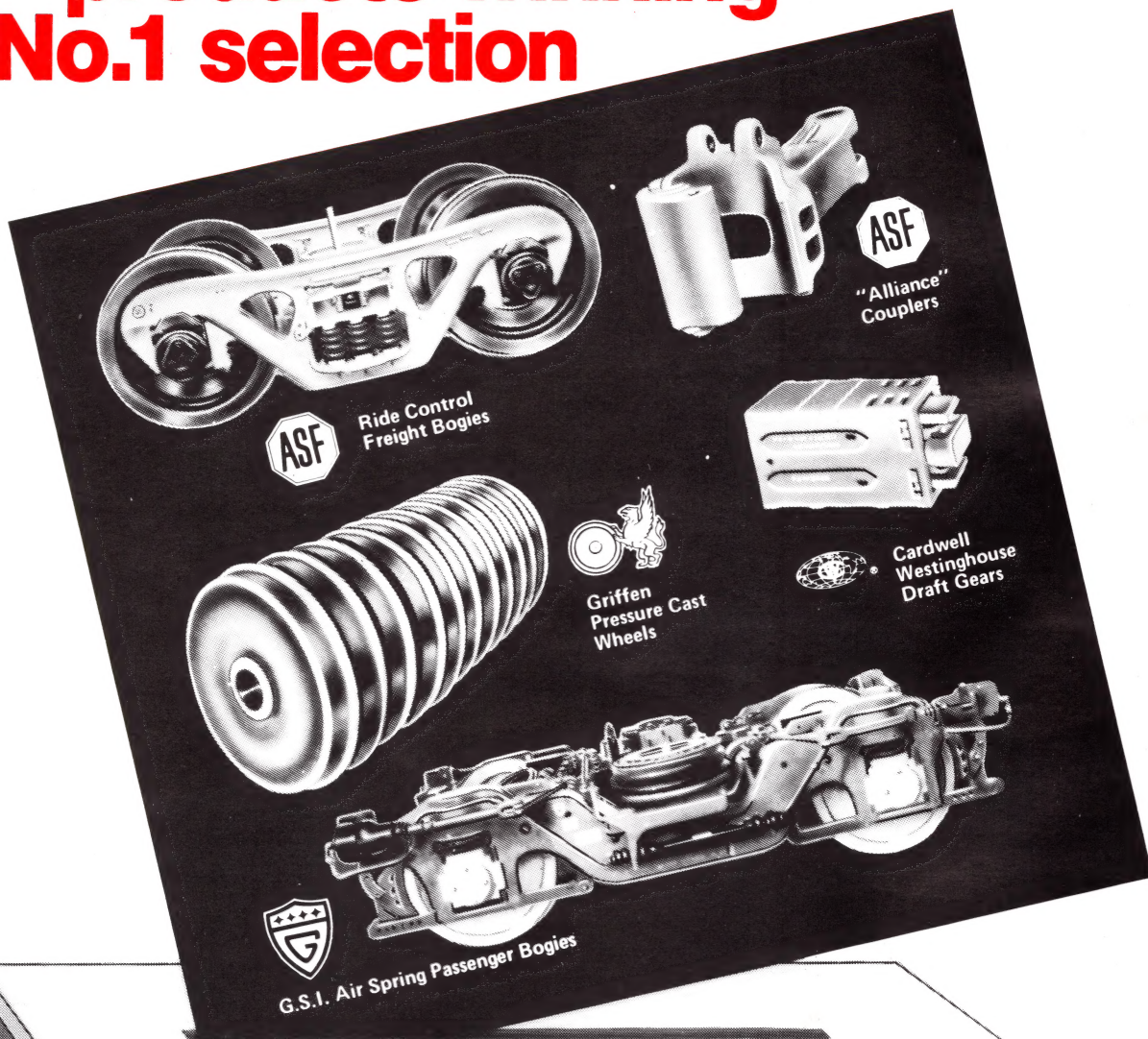


ISSN 0159-7302



New intermodal fast freight service (page 6)
Light pen journey around Australia (page 10)
Illawarra electrification (page 12)
Railways rev up in Queensland (page 38)

When the vote is 'cast' you can count on **bk** railways products winning No.1 selection



Proven reliability and quality with engineering design excellence

bk products are backed by sound engineering and highest quality manufacture. **bk** castings have a great track record with all Australian railways. The latest developments for cast locomotive, passenger, freight bogies and other essential cast railway products

are produced by Bradford Kendall Foundries from their own proven designs or under licence from designers renowned throughout the world. Whatever your specific requirements, simply say **bk!**

For the
best in
railway
equipment

... just say
bk

BRADKEN CONSOLIDATED

A Division of The ANI Corporation Limited (Inc. in NSW)

22 O'Riordan Street, Alexandria, NSW 2015

Foundries: NSW: Alexandria (02) 699 3000 • Vic.: (03) 354 1281.
QLD.: (07) 345 1121 • S.A.: (08) 262 1237. W.A.: (09) 335 4855.

Network

Railways of Australia Quarterly
Vol. 23 No. 2
April, May, June 1986

Published by the Railways of Australia
Committee, 325 Collins Street,
Melbourne, 3000. Tel. 61 2545

Railways of Australia is an association
of the government-owned railway
systems, comprising:

*Australian National • The State Rail
Authority of New South Wales
• Queensland Railways • State
Transport Authority - Vic • Westrail.*

Editor: Alex Greig

Advertising Enquiries:

Advertising Enquiries to be addressed
to The Advertising Manager, Railways

of Australia 'Network',
325 Collins Street, Melbourne,
Vic. 3000. Tel. 61 2545 or the
following State representatives:

N.S.W.: Patrick Carr, Commercial
Union Assurance Building,
109 Pitt Street, Sydney,
N.S.W. 2000.
Tel. 232 1026, 232 8072

Qld.: International Media Services
(Aust.), P.O. Box 190,
East Brisbane 4169.
Tel. (07) 393 0758

S.A.: Market Media Associates,
79 McLaren Street, Adelaide
S.A. 5000
Tel. 223 6344, 223 6629

W.A.: Wilson's Editorial Services,
P.O. Box 40, Balga, 6061.
Tel. (09) 349 5798

*Railways news items appearing in
Network may be reproduced with
acknowledgement of the source. This
does not apply to contributions from
overseas travel writers which are
copyright.*

Contributions:

Articles, news and/or photographs
(with captions) — covering any phase
of rail activity are invited for
consideration by the Editor,
R.O.A. Network, 325 Collins Street,
Melbourne, 3000.

Subscriptions:

Within Australia, \$12 per annum
(posted). Overseas, A\$16 per annum
(surface mail).



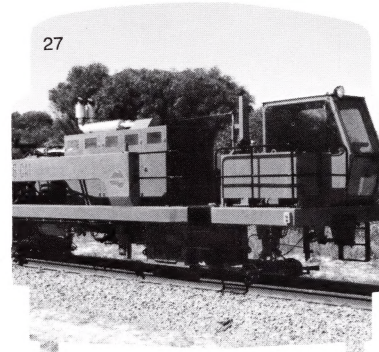
Australian National



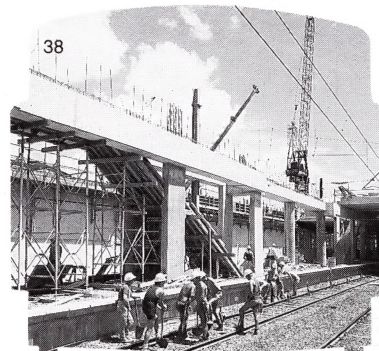
State Rail Authority of NSW



V/Line



Westrail



Queensland Railways

Contents

Executive Director's column	page 5
New intermodal fast freight service	6
Light pen shows the way around	
Australia	10
Illawarra electrification	12
V/Line passenger market	16
National Trust discovers treasures in	
Victoria	20
At the workplace	22
Bookshelf	26
Track machine an Australian first	27
Monorail system for Darling Harbour	31
SRA Station redevelopment underway	34
Perth suburban system to go electric	35
Railways rev up in Queensland	38
Machines of brawn and beauty	46
100 years of railways engineering at	
Ipswich	51
Window seat	62

Front Cover:

*V/Line car traffic exceeded
expectations in 1984-85, the increase
being evident again this year. This train
with a substantial complement of cars
aboard pictured around dusk at
Barnawartha in Victoria is bound for
Sydney.*

*Our only requirement of writers and
personalities who contribute to Network is
that they be informative or entertaining
and that their subject has relevance to
the wide interests of railwaymen today.
Naturally, there will be occasions when
their viewpoints or opinions run contrary
to those of the editor or to Railways of
Australia. We must accept that these
differences are among the elements
essential to the presentation of a lively
and interesting magazine.*

AUSTRALIAN NATIONAL THE PRIME MOVER



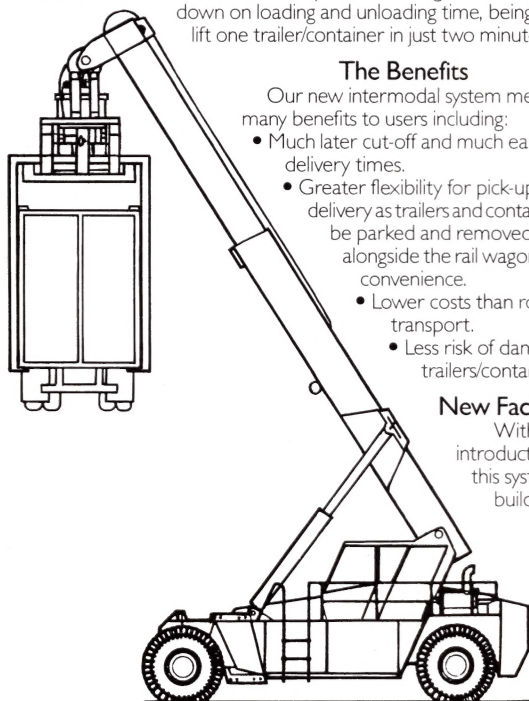
Australian National, the nation's primemover of general freight between the Eastern States and Western Australia and the Northern Territory is set to consolidate its position by introducing an innovative intermodal system firstly between Adelaide and Alice Springs and then between Adelaide and Western Australia.

Intermodal Innovation

The new intermodal system is designed to attract more road trailers to use our "piggyback" service, and to facilitate the handling of container traffic. The system embodies the use of wagons fitted with hitches for quick and easy securing of trailer king-pins, with the semi-trailers being lifted onto and off wagons instead of being driven on and off loading ramps.

The Piggybacker

The star of our new prime moving show is the piggybacker. Able to lift trailers and containers up to 40 tonne gross mass, it cuts down on loading and unloading time, being able to lift one trailer/container in just two minutes.



The Benefits

Our new intermodal system means many benefits to users including:

- Much later cut-off and much earlier delivery times.
- Greater flexibility for pick-up and delivery as trailers and containers can be parked and removed from alongside the rail wagon at your convenience.
- Lower costs than road transport.
- Less risk of damage to trailers/containers.

New Facilities

With the introduction of this system, the building of



new intermodal yards is in progress at Islington and Alice Springs. Our new designs facilitate unrestricted pick-up and placement of trailers by allowing for loading to take place on one side of the track and unloading on the other side.

Contact Australian National Now

With our innovative intermodal system, you'll be wanting to save time and money from now on. Call us now, we'll be only too happy to discuss your intermodal linehaul requirements with you.

Keswick Headquarters

1 Richmond Road, Keswick S.A. 5035 Telex: 88445
Ring Geoff Charlton on (08) 217 4758 or Peter Moller on (08) 217 4759

Melbourne

Embank Arcade, 325 Collins Street, Melbourne Vic. 3000
Ring Esmond Fernand on (03) 62 5181/62 4399

Sydney

Suite 3, Third Floor, Citicorp House, 30 Darcy Street, Parramatta NSW 2150
Ring John West or Barry Kite on (02) 689 3655

Perth

Suite 3, First Floor, City Arcade Office Tower, 207 Murray Street, Perth WA 6000
Ring Dave Reid on (09) 321 8817



**Australian
National**

The Link to nationwide freight transport.

the
**EXECUTIVE
 DIRECTOR'S**
 column

Research: unseen, unsung and essential

Most rail passengers, when they step into their train, expect it to operate smoothly and well - without giving a thought as to how this is accomplished. Similarly, shippers of freight expect their goods to be carried without damage and at high speed to their destination.

Again, they just assume that the rail track will do the job expected of it.

It has frequently been pointed out that railways, unlike other modes of transport, must provide their own dedicated right of way.

Roads are a community asset; seaports and airports are available to all in return for a charge, and the actual right of way for sea and air is a gift from nature.

But the provision of track and other items of infrastructure is one of rail's costliest items. To maintain, repair and reconstruct Australia's 40,000 kilometres of track, rail systems spend approximately \$600 million annually.

Obviously, any saving on this amount is significant, and it is here that the Railways of Australia Committee plays its part.

The Committee encourages systems to co-operate in areas where money can be saved by joint effort - and the research study necessary to reduce rail track costs is a most fruitful field for this effort.

The Vehicle/Track Studies Co-ordinating Committee was set up by ROAC with the objective of minimising operating costs of Australian rail systems through the provision of technical information related to the interaction between vehicle and track.

It has the task of co-ordinating research carried out under the auspices of Railways of Australia, ensuring that it is current, relevant and economically justifiable.

It manages the research program comprising a series of studies with specific measurable objectives.

In this, it is assisted by the Engineering Research Manager appointed early in 1985, as reported in "Network", to provide a

permanent basis for this co-ordination.

Observant travellers on Westrail's "Prospector" between Perth and Kalgoorlie will notice, as the train passes between Northam and Merriiden, a series of boards beside the track.

These boards identify the location of ROA Track Study No. 2 - part of a 10 year program monitoring the performance of different track structures, which started in 1980.

Along Westrail's track, 18 sections each one kilometre in length have been constructed with different characteristics.

The rail size is standard throughout at 60kg/m, but sleepers are of three types - concrete, timber and steel; sleeper spacings are varied; ballast type and depth is varied, as are rail fastenings.

Although this study is only half way through its intended length of time, trends are already becoming evident as the continual monitoring process takes place.

Some advice has already been available to participating rail systems and the progression of the study to its conclusion should produce even more definitive data.

An earlier study, now completed, has provided data on the actual magnitude of loading imposed on railway track by various types of freight vehicles currently operating in Australia.

It has assisted in quantifying the effect on the track of various types of freight bogies.

Appropriate speed limits for various types of freight vehicles have been recommended.

In conjunction with the University of Adelaide, ROA has developed a vehicle simulation program.

This computer technique enables analysis of a wide range of vehicle types and operating conditions, which can only be partially examined using instrumentation.

The model developed by the University is now in place in the computer systems of most Australian

systems, and provides a valuable calculating tool for examining vehicle performance, and for the specification of bogies when these are ordered from manufacturers.

Other studies have dealt with the profile of wheels in relation to rail surfaces; and produced a Track Design Package, an interactive computer program which assists in the evaluation of alternative track structural designs.

Research into track and vehicle interaction is of necessity a lengthy process. It is also expensive.

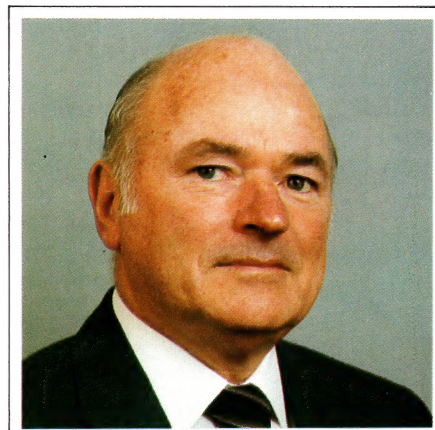
Its very nature makes it an ideal medium for the co-ordinating responsibilities of the Railways of Australia Committee, which also maintains a close watch on similar developments overseas.

Co-operative action in these areas results in an overall saving to each participating railway.

I believe that it is in fields such as these that the Railways of Australia Committee will continue to play an increasingly important part in the years ahead.

Michael Schrader

M. C. G. SCHRADER
 EXECUTIVE DIRECTOR



M. C. G. Schrader

New intermodal fast freight



AN's new 'piggyback' machine loads and unloads semitrailers weighing up to 40 tonnes.

Australian National has completed installation of facilities for a fast new intermodal freight service at its Islington (Adelaide) and Alice Springs rail terminals.

The new service - designed to attract more road trailers to use AN's 'piggyback' services and to facilitate the handling of containers - became fully operational in January.

It provides dramatic time savings in the loading and unloading of both road trailers and containers and enables faster transit times between the two rail terminals.

The \$5.3 million development is stage one of a two stage development being financed by a special Federal Government grant. Stage two, aimed primarily at the Adelaide to WA route is planned for

1986/7 at an additional cost of \$3.6 million.

The new Adelaide - Alice Springs intermodal freight service is faster than normal services and AN is confident it will help retain rail's major share of freight transport between South Australia and the Northern Territory after completion of sealing of the Stuart Highway. The system embodies the use of piggyback rail wagons fitted with hitches for quick and easy attachment of semi-trailer turntable king-pins, with the semi-trailers being lifted onto and off wagons instead of being driven on and off of end loading ramps.

The hitches are retractable to permit end drive-on loading when necessary.

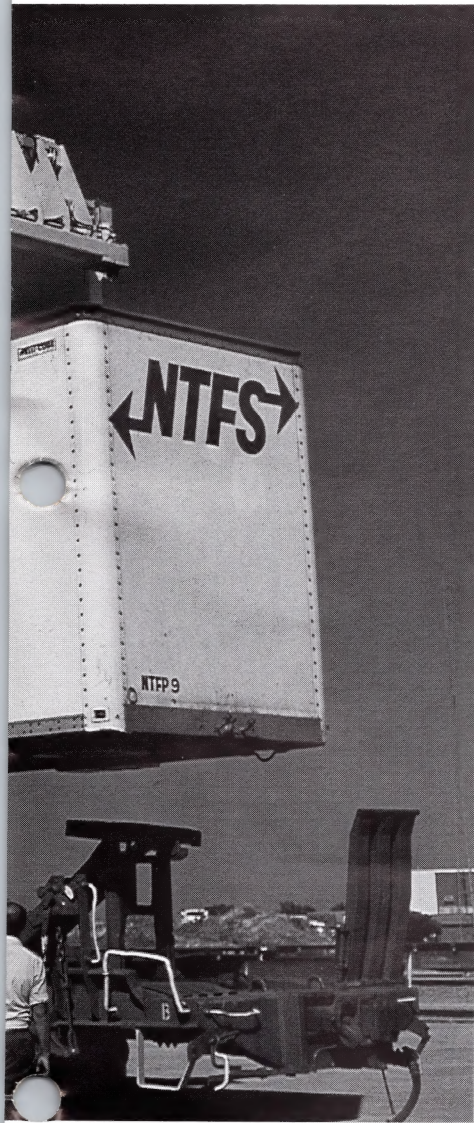
At its Islington Freight Terminal, AN has constructed a special intermodal grid with additional rail tracks and paving and purchased a 'piggyback' machine for loading/unloading and positioning of load road trailers weighing up to 40 tonnes.

A 'piggyback' has also been obtained for Alice Springs Terminal in addition to construction of a loading/unloading area adjacent to existing rail track.

The system's major benefits to users include:

- Much later cutoff and much earlier delivery times than at present.
- Less damage to trailers.
- Greater flexibility for pick up and delivery as trailers and containers

Service connection to the Alice



Top: 'The new Adelaide-Alice Springs intermodal freight service is faster than normal services.

Bottom: The system embodies the use of piggyback rail wagons fitted with hitches for quick and easy attachment of semitrailers.

can be parked and removed from alongside the rail wagon at the customer's convenience.

- Lower costs than road.
- The system is designed to lift trailers and containers to 40 tonnes gross mass.

Trailers using the new intermodal system have to be adapted for lifting at four points.

The 'piggypackers' have four relatively large (750 x 150mm) lifting pads designed to minimise the magnitude of any trailer modifications.

Some vans with floor members at the same level as the side panel require little more than the addition of lifting plates while those with extended side panels need some additional strengthening.

The decision to establish the system followed a detailed study of overseas and local developments in the intermodal freight industry. The system chosen by AN is similar to that operating in North America. The new Islington intermodal yard is adjacent to the existing freight terminal. It is 800 metres long and designed for loading to be placed on one side of the track and unloaded trailers and containers to be placed on the other side. This enables unrestricted pick-up and placement of trailers. At Alice Springs the intermodal yard is located adjacent to the existing gantry crane area.

The 'piggypacker' is used operating on one side of an existing 1000m length of track.

Both yards have been designed to allow complete intermodal trains to bypass existing marshalling yards and commence and terminate directly in an intermodal yard. Unloading of the trailers and containers commences as soon as the locomotives have been detached from the train. The loading/unloading rate of the lifting equipment is one trailer/container every two minutes.



The clip



Pandrol Australia Pty Ltd,
7 Bessemer Street, Blacktown, NSW 2148.
Ph: (02) 671 6555 Telex: AA24133
28-30 Davison Street, Maddington, WA 6109.
Ph: (09) 459 5255 Telex: AA94531

Britain, France agree on chunnel

French President, Mr Mitterrand, and the British Prime Minister, Mrs Thatcher, recently announced their countries would be linked by a double rail tunnel under the English Channel.

They told a news conference that a road link could eventually be built as well. The rail link will become operational in the 1990s.

The two countries have accepted a proposal submitted by an Anglo-French consortium known as Channel Tunnel Group-France Manche.

The project had been competing with four other proposals that combined both road and rail links. Speaking after his meeting with Mrs Thatcher, Mr Mitterrand said: "I can tell you know that the two states have chosen the project France Manche-CTG."

Mr Mitterrand said the winning consortium would have an exclusive 15-year concession to build and operate the link.

Latest estimates put the total cost of the scheme at \$US4 billion (\$A5.73 billion).

Mrs Thatcher said the two governments would consider the building of a parallel road link in the year 2000.

The announcement followed an hour-long meeting between the British and French leaders in Lille to put their seal on an agreement worked out by their transport ministers.

Mrs Thatcher described the decision as a dramatic step forward in Anglo-French co-operation and a challenge to the private sector, which would be wholly responsible for building and operating the twin-tunnel rail shuttle scheme.

Investors world-wide would be welcomed to take part in financing the project, she said.

Mrs Thatcher held a further press conference in Canterbury several days later explaining additional details about the channel link to the British media.

The project will consist of a rail-only link of two 50-kilometre tunnels underneath the channel from Folkestone to Calais.

Britain argued for a road but the French objections based on technical difficulties and cost prevailed.

Rail passengers will be able to travel direct from London to Paris in little over three hours if fast French trains are used. This is possibly faster than

present flying time after taking account of the airport to city time. Motorists will be able to drive on to trains at either end of the tunnel and stay with their cars — either sitting inside or walking about the train — for the half-hour trip from coast to coast. The capacity will be about 4000 vehicles an hour in each direction.

The French Government originally wanted some public sector involvement but Mrs Thatcher stuck to the British condition of a fully private enterprise effort.

Work could begin by the middle of next year and construction is expected to take at least five years. Mrs Thatcher has said she is anxious to begin the task "because our generation needs something exciting."



Historic home for new training centre

Queensland's Transport Minister, Don Lane recently opened a new Rockhampton Railway Training Centre (Monday, 16.12.85) in a building that is 100 years old.

The \$½ million training centre on the corner of Stanley and Denison Streets was formerly used as the Railway Administration Offices, and now has become part of Rockhampton's heritage.

It is the second major regional training centre to be opened by Queensland Rail, the first being established in Brisbane in March last year.

Training facilities also have been established at Toowoomba,

townsville and Maryborough.

Queensland Railways has recognised the need to establish training centres during the 1970's,

when substantial technological changes associated with electrification and the introduction of other modern equipment meant staff skills had to be upgraded.

Mr Lane said former Railways Commissioner, Jim Goldston, had used foresight and initiative to launch an organised program of staff training to give Queensland Rail employees the opportunity to keep pace with technological change.

"The refurbished building, and the old data processing building and drafting office, will house all training for Central District personnel," Mr Lane said.

"The ground floor will be used for traffic employees' training courses, while the top floor will cater for maintenance people. Loco training

will be conducted in the refurbished data processing building.

"To train drivers to operate the new electric locomotives being built to haul coal from the various mines to the ports, special driving cab simulators will be installed at Callemondah and Jilalan".

The land on which the restored building stood was bought by the Railway Department in 1884, and later that year a contract was awarded to Messrs Bugden and Smith to construct the building for six thousand, two hundred and eighty-nine pounds, seven shillings and six pence.



LIGHT PEN SHOWS THE WAY AROUND AUSTRALIA

By Alan Crane
of the London Financial Times

Travellers from the UK planning to see Australia by train are being helped on their way by one of the most exciting developments in information technology — the expert system. An offshoot of research into artificial intelligence, expert systems make it possible to capture the experience of an authority on a subject and make it available to the lesser qualified.

They have aroused great interest in companies which see advantage in being able to archive the knowledge and experience of expert staff. Such a man is Mr Derek Townsend of Thomas Cook, the world's largest travel agency. His knowledge of the Australian railway system, built over "more years than I care to remember", as he puts it, is unrivalled.

That experience is invaluable to Thomas Cook. It is the general sales agent in the UK for Railways of Australia, which means that all enquiries and bookings, whether from British Rail, British Airways, other travel agents or Cook's own offices, are funnelled through Mr Townsend's department.

He has a small team at Cook's headquarters in Peterborough which deals with day-to-day enquiries regarding departure and arrival time, itineraries and so on. The team used to spend its time thumbing through

voluminous timetables to provide information in response to telephone enquiries, calling on Mr Townsend when his expert knowledge was required. Now the timetables have given way to a personal computer, an IBM PC XT, and travel information appears on the screen in response to judicious prodding with a "light pen", a hand-held pointer.

The system was built by Thomas Cook in conjunction with Expert Systems International of Oxford, a leading artificial intelligence organisation. Its other projects include Alfex, an expert system being built for a club of financial institutions which is intended to measure the financial health of companies.

Ease of use was a prime consideration in developing the Cook system. Every query starts with a coloured map of Australia on the screen showing the railway system in diagrammatic form. Routes are planned by touching the light pen first on the point of departure and then the point of arrival; dates are chosen from a calendar painted electronically on the screen.

To some extent, this could be done using conventional data processing techniques given an automated timetable; the expert part of the Cook system is the way it searches for information in the files in its memory mimicking the methods built up by Mr Townsend.

It slips in information that does not

appear in the official timetables; without a pass, for example, people cannot leave the train at the station serving the Woomera rocket range. Thomas Cook see its Railways of Australia system as the first of a series which it intends to install to store and make available its vast hoard of knowledge about the travel business. It was written in Prologue II, a computer language with its rules of operation based in formal logic. Thomas Cook has a long record of innovation in applying technology to the leisure business so it is perhaps not surprising that it moved quickly in a new area.

Computer double is a high-tech first.

Travel expert Derek Townsend has a science fiction-style "double" in his office.

And it is a first for the world's largest travel agency, Peterborough-based Thomas Cook.

'System
is first
of a
series'

The double, a computer, has been fed with all Derek's detailed knowledge about Australian Railways.

When the human Derek is not there the computer version can take his place — up to a point. The experimental "expert system" also speeds the work of Derek and his colleagues.

They are a team of five general sales agents, based at Thorpe Wood, who handle travel in Australia and elsewhere.

Derek, of Eyrescroft, Bretton, said: "It's a bit strange to think that this information is the stuff that I have accumulated over the years.

"You are always learning something. You think you have had every problem it's possible to have, but you get something every day".

Much of the information is available from timetables, although it takes longer to find.

But Derek (50), who has travelled on Australian Railways, was able to add more during four months questioning. For instance, to get off at Pimba station you need a permit — because it is in the Woomera rocket range.

If the system is successful other railways — United States, Canada and New Zealand — could go on to computer. Retail offices could get access to them in the future.

Thomas Cook's technology consultant Bob Ruckwood believes the company is the first in the travel world to install an "expert System".

Tea party

Tea Party on 'The Alice' to Wonderland

There is something romantic about long train journeys. Leisurely meals in the Dining Car, making new friends over a drink in the lounge whilst the piano plays, and relaxing as the countryside slips by make train travel a pleasure.

Passengers travelling on "The Alice" and "The Indian Pacific" between Sydney and Port Pirie were treated to unusual hospitality late in 1985.

They were woken by the rustle of heavy silks and gold brocade as three beautiful sari-clad girls offered wake up cups of "Royal Assam" Indian tea.

Shuva Sen, Mina Vahie and Christobel D'Souza were accompanied by Mr D R Karthikeyan, Director, Tea Promotions, on behalf of the Tea Board of India and served the teas of Darjeeling, Assam and Nilgiri on the two trains.

They presented passengers with complimentary packs of Indian tea while telling the story of tea growing in India, and offered advice on how to tell different types and qualities, as well as tips on how to make the best brew.

Shuva Sen, who comes from West Bengal, near the Darjeeling area, remembers the lush tea plantations growing in the shadows of the Himalayas.

Tea was gathered only by women who delicately plucked the tender "Top two leaves and a Bud" to produce the aromatic Darjeeling tea. "I also remember the tea shops in Calcutta, the background would be stacked high with wooden chests, the tea spilling out and smelling lovely" said Shuva. "Most people think all tea is just tea, but I grew up learning the different grades, blends and aromas".

With each meal on "The Alice" and the "Indian Pacific" a tea from a different region of India was served. **Darjeeling** "the champagne of teas", **Royal Assam** from the forest land of



Lovely Shuva Sen of the Tea Board of India pours a final "cuppa" for Assistant Stationmaster Keith Cutler before "The Alice" left Sydney Terminal. Passengers on the train were treated to various Indian teas on the journey to Port Pirie. Shuva and her friends also served passengers on the "Indian-Pacific" returning to Sydney.

elephants and rhinoceros, **Nilgiri** from the "Blue Mountains" of India's south and exotic tea cocktails as pre-dinner drinks were offered to all passengers.

During longer stops at Broken Hill

and Port Pirie The Tea Board of India promotional team were able to meet the press and local people. Passengers on both trains were delighted to try the blends - and a new tea experience!

...on 'The Alice' to wonderland

\$230 million electrification p



The first official electric train pulls into Wollongong.

“Switch On To The Electric Illawarra” - that’s how State Rail promoted the opening on February 4 of the \$230-million electrified rail line between Sydney and Wollongong/Port Kembla.

And the people of the Illawarra are now seeing just how much of an improvement electrification has brought to their train services. When officially opening the service at Wollongong City station, the Premier, Mr Wran, told a crowd of about 2,000 people:

“This is a great day for Wollongong - a great day for the Illawarra.

“I prophesy this is the most significant event for Wollongong since the Railway first opened in 1988.”

Mr Wran said electrification would open up the Sydney job market for young job seekers and women (in Wollongong) who found work hard to get at home.

It would also attract visitors to the beaches and lakes of the beautiful Illawarra region, he added.

Two \$12-million InterUrban trains took SRA officials, retired rail workers and other invited guests from Sydney to Wollongong for the official opening.

Champagne.

The first official train was “Christened” at Sydney Terminal by former Transport Minister Barrie Unsworth, who broke a bottle of champagne over the leading carriage. At the Wollongong festivities, State Rail provided refreshments and drinks

Project adds spark to rail service



Above: A large crowd gathered at Wollongong Station for the opening by the Premier. Left: Premier Neville Wran with the driver of the first train, Mr. Ron Chisholm of Wollongong.



This is the most significant event for Wollongong since railway first opened in 1888 - Premier Wran

for the large crowd of local people and other invited guests.

Viaduct Delay

OPENING of the Illawarra electrification project was originally planned for December 15 last year, but damage to the Stanwell Park viaduct forced closure of the line only three days before. The damage was caused by geological shifts along the nearby Illawarra escarpment.

State Rail workers and private contractors worked 24 hours a day, seven days a week repairing the viaduct.

At the February 4 opening ceremony, SRA Chief Executive David Hill highly praised the workers for their dedicated efforts.

In an earlier statement he said: "We are very proud indeed of our engineers and construction staff who have managed to achieve so much in so little time".

The sixth arch of the viaduct suffered the most damage and was replaced with a steel span.

The seven other spans were strengthened with tension rods inserted across the viaduct to tie the tops of the arches together. Brick parapets on three spans were strengthened by a system of steel supports.

A British Rail engineer was flown to the site from London to advise on the work needed.

... and problems caused by

(continued from page 13)

Big Demand On Service

RAIL electrification has brought big improvements for commuters between Sydney and the Illawarra, and State Rail passengers were quick to reap the benefits.

Two days after the new services began, demand for them caused State Rail to add two carriages to the initial four-car set leaving Wollongong at 6.17 a.m.

This built up the InterUrban train's seating capacity to 600, 130 more than at first.

The air-conditioned double deck trains cut 36 minutes from weekday trips to Wollongong and 32 minutes from the run to Sydney.

Trains run half-hourly during peak periods and hourly off-peak.

Express trains stop at Hurstville, Sutherland, Thirroul and Wollongong only; semi-express trains also stop at Waterfall then all stations to Thirroul.

More frequent rail services with a better standard of passenger comfort are available to the South Coast on weekends and public holidays.

The Sydney-Nowra corridor now has extra and faster services; they are an average of 30 minutes faster with maximum saving of 54 minutes.

As well, from March 1, the SRA extended the Outer Metropolitan Area to Nowra - resulting in cheaper mini-fares.

The electrification project from Waterfall to Port Kembla began in 1982, 94 years after the first steam trains ran from Sydney to Wollongong.

Work at times was round-the-clock, seven days a week.

The Illawarra escarpment is one of the most beautiful parts of Australia, but its topography posed enormous challenges to railway engineers.

Construction and access problems with cuttings, embankments and tunnels were encountered along almost the entire route.

Special environmental safeguards were incorporated into the project to



One arch of the Coal Cliff viaduct had to be completely replaced.

ensure minimal impact on native plants and animals, national parks and waterways.

Throughout the project, State Rail liaised closely with National Parks and Wildlife Service, the Soil Conservation Service and the State Pollution Control Commission.

The track has been totally upgraded and strengthened - including drainage improvements, ballast cleaning, re-ballasting and re-surfacing of the track.

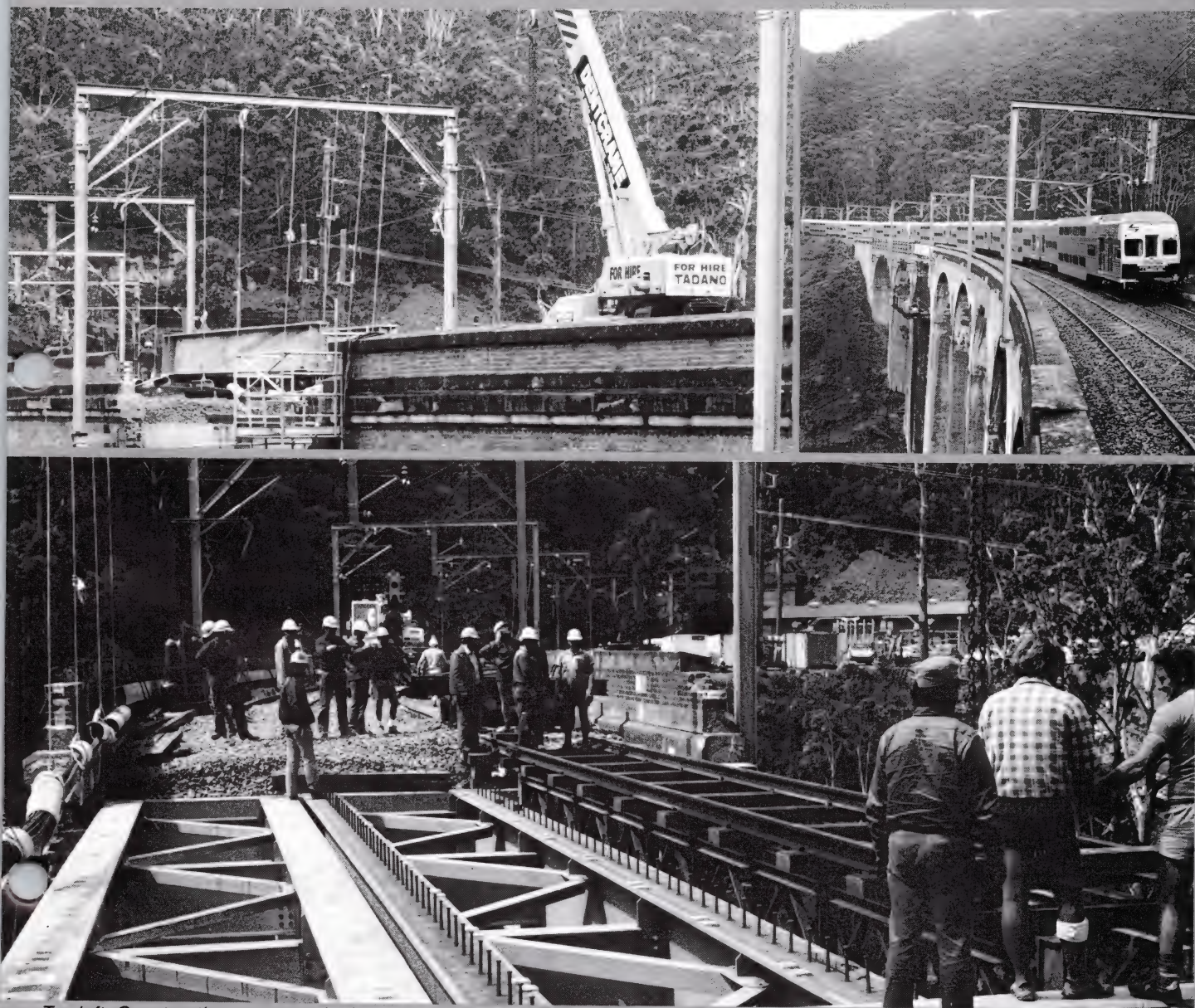
Major works were carried out in seven tunnels - including the 1-km Coalcliff tunnel.

Floors of the tunnels were lowered to accommodate the double deck cars and overhead wiring.

Bridges

Eighteen bridges were raised or rebuilt also to obtain the required clearance between track level and overhead wiring.

Ecological shift are overcome



Top left: Construction crews worked around the clock to repair Coal Cliff viaduct.

Top right: An interurban train pictured near Stanwell Park. The advantages of travel in this type of train have not been available previously for Illawarra passengers.

Bottom: A close up view of the replacement of the span on the viaduct.

Level crossings at Clifton, Woonona, Bellambi, Corrimal, Fairy Meadow and North Wollongong were converted to automatic operation.

The crossings at Fairy Meadow, Corrimal and North Wollongong will eventually be replaced by bridges.

Track layouts were altered for coal and other freight trains to operate without interfering with the running of passenger trains.

Stations, yardworks, and signals and communications have also been improved.

Electric power for trains has many advantages over power from diesel fuel.

Electric trains do not produce exhaust fumes, require less maintenance, and are quieter and cheaper to run.

NSW is self-sufficient in generating electricity from its vast coal deposits - a coal benefit that is becoming more apparent as the costs of other fuels continue to rise.

The SRA's newest electric locomotives have a regenerative braking system

that feeds unused electricity back into overhead wiring for use by other trains.

ILL

Integration the key to v

Since V/Line was given total responsibility for the administration of the privately owned and operated road coach network outside the metropolitan area, 'integration' has been the catchword of the passenger market.

The transfer of the responsibility for the private road passenger service network to V/Line has effectively, for the first time, provided the opportunity for the development of a totally integrated network of services throughout the State.

The lack of integration between road and rail services has been a major stumbling block in the effort to provide better transport service to the people of Victoria.

General Manager Passenger Services, Len Harper, said that formerly the State system consisted of a large country passenger service, the railways, and an extensive system of road passenger service operators, working independently of each other.

He said: 'Already there have been a number of developments under the new V/Line banner. New services involving various business opportunities have been introduced by V/Line in conjunction with the bus operators.'

These new developments include a Warrnambool-Mt Gambier service, introduced 19 November, 1984; a Speedlink passenger service inaugurated between Sydney and Adelaide via a V/Line coach from Albury to Adelaide, 2 December, 1984; Lang Lang-Inverloch coach service introduced 9 December, 1984; Ballarat-Geelong Sunday service introduced 2 June, 1985; Warrnambool-Ballarat service introduced 3 June, 1985; Murray express, Albury-Mildura service introduced 2 September, 1985; Dandenong-Cowes service introduced 2 September, 1985; and a Cobram-Shepparton-Melbourne and Shepparton-Melbourne service introduced 27 October, 1985.

These services have been developed to increase the business for V/Line. Some have been introduced as feeder services to rail,

Memos

State Transport Authority
589 Collins Street,
Melbourne, Victoria. 3000.

TO:
Mr. L. Harper
General Manager
Passenger Services Division

A.F.T.A. AWARD

I was surprised and delighted to learn of last night's AFTA Award to V/Line in the category of Australian Tourist Services, for V/Line's contribution to the development of those services during 1985. Of course we know that V/Line's Passenger Services Division is doing the job. However, it is even nicer to know that others also recognise that V/Line is going places.

Coming on top of the earlier award by the Melbourne City Council for V/Line's contribution to the 150th Anniversary, in particular its sponsorship of the Melbourne Military Tattoo and its efforts in bringing people to the City of Melbourne, this latest award is doubly encouraging.

It is also a great achievement that V/Line was nominated for the National Tourism Awards in the category of Contribution to the Australian Tourist Industry through Transportation.

I should like to confirm my personal congratulations to you and ask that you pass my congratulations on to all those in your Division who have contributed to the elevation of V/Line to the ranks of high marketing achievers.

K.M. Fitzmaurice
Chairman and
Managing Director STA

and others to operate as new travel ventures which can be used to expand V/Line's tours and holiday business.

Extensive market research in the form of regional public transport studies has been undertaken and completed in a number of V/Line's regions.

One such study, in the Goulburn Valley, resulted in the introduction of the Cobram-Shepparton-Melbourne and Shepparton-Melbourne services. Mr Harper said the main point that came out of the study was that the former service network was disjointed and was not conducive to travel.

He said: 'Both services were introduced to be supplementary to trains. Our customers are now being

offered a range of services at more marketable times. They can take the coach to Melbourne and return on the train or vice versa.

'The Cobram-Shepparton-Melbourne is an express service to Melbourne from Shepparton while the Shepparton-Melbourne service travels via Tatura and Murchison.

'In essence, the reorganisation in that area provided a different timetable and different travel opportunities in line with what our customers wanted'.

By integrating and co-ordinating the system V/Line plans to encourage more people to travel by providing more travel opportunities.

Hence the introduction of the Murray express, Albury-Mildura coach service.

'IT'S VERY MUCH A MATTER OF IDENTIFYING TH

V/Line passenger market

L.J. Harper
General Manager
Passenger Services Division

TO:
J.A. Hearsch
Chief General Manager
Transport Operations Division

A.F.T.A. AWARD

Please see the letter of congratulations from the Chairman, following our recent achievements in the Travel Industry Awards.

No one particular Division can take the credit for such a result and insofar as P.S.D. is concerned, a major part of the award credit goes to T.O.D. I would be pleased if you could pass on our gratitude to your relevant people.

L.J. Harper
General Manager
Passenger Services Division

With the introduction of this service, people can now travel from Melbourne to Albury by train, continue through the Murray Valley area on a coach through Swan Hill and Echuca to Mildura, and then back to Melbourne by train.

Mr Harper said that V/Line's part was to operate two sectors of the journey, and a linking service is provided by a private operator. 'We can package the three sectors and our tour people can sell it as a total holiday'.

Also in the Albury area in the Speedlink service which provides a link to Adelaide connecting with the XPT at Albury.

Speedlink took several months to develop but is now a profit-making concern.

In recent months the State Rail Authority in NSW has launched a publicity and advertising campaign to promote the Speedlink service. It now has the service available through all its agencies, and the latest figures show a keen interest from the NSW end.

Two of the services introduced to integrate train and bus travel were the Warrnambool-Mt Gambier service and the Warrnambool-Ballarat service.

Both routes formerly were operated by a private operator and the services were not convenient to travellers, one in terms of price, the other in terms of a poor connecting service.

Mr Harper said: 'In the case of the Warrnambool-Mt Gambier service the coach was connecting with the train but passengers had to purchase a separate ticket to go to Mt Gambier, which made it an expensive trip.

'The operator initiated the idea of a joint agreement. We have since put the service into the V/Line fare system, reservation system and marketed the service as a package'. Since the service began, V/Line has seen a 30 per cent increase in traffic on the coach service, some of which has flowed on to the train service.

To provide improved connections to the Melbourne-Ballarat rail service a revised timetable was introduced on the Warrnambool-Ballarat coach service. As well as the timetable changes the coach was also included in the V/Line fare and reservation system.

In South Gippsland area two services were upgraded to provide more convenient travel opportunities to local residents.

For the Lang Lang-Inverloch service, Mr Harper said a return coach service was introduced to meet trains at Lang Lang, travelling to and from Melbourne.

He said: 'The service was introduced mainly for the benefit of local residents in the Inverloch-Wonthaggi areas, who can now travel to Melbourne and Dandenong

to shop or visit those areas for the day'.

The other service to be introduced in the South Gippsland area was the Dandenong-Cowes coach.

Formerly, a weekday co-ordinated service to and from Cowes was provided by a private operator, and for some years the local community had requested additional services to and from Cowes.

V/Line, with the operator, introduced a co-ordinated service which operated additional trips including a weekend service.

The introduction of the weekend service has enabled V/Line to provide weekend travel opportunities for local residents and opportunities to cater for a large tourist market attracted to that area.

In another effort to attract new markets, V/Line introduced a return service between Geelong and Ballarat on Sundays.

A return service from Monday to Saturday had been operating between the two cities for some time; however, demand from students wishing to return to colleges in Ballarat on Sunday resulted in the introduction of the service.

Mr Harper said: 'We started that service to cater mainly for the students but have now discovered that V/Line has been able to generate new traffic coming down to Geelong in the morning and then returning to Ballarat in the afternoon.

We have tapped a completely new market and the figures have been increasing every period.

Overall, the new coach services introduced by V/Line are the result of market-based business decisions and have not only led to an increase in patronage but also to an increase in the travel opportunities and packages V/Line can offer the travelling public.

Mr Harper said: 'It is very much a matter of going to the public and identifying their travel needs, and on that basis establishing the supply of services using both road and rail in the most efficient way'.

PUBLIC'S NEED AND PROVIDING THE SERVICES'

Want to know more about Australian Railways?

Two "Double Fairlie"
locomotives were
built in 1879.



Canberra-Sydney XPT in Southern N.S.W.



Gold Coast Motorail, Byron Bay.

Take out a 12 month subscription to 'NETWORK' for only \$12!

Posted anywhere in Australia, a NETWORK subscription can bring a great deal of pleasure to the railway enthusiast.

NETWORK is full of colour and interest, and is the only official magazine of Railways of Australia. Makes an ideal gift too!

Network is published quarterly, in January, April, July and October.

Send the coupon now to:

**Circulation Manager, 'NETWORK', Railways of Australia Committee,
325 Collins Street, Melbourne, Victoria 3000.**

Please mail 'NETWORK' for 12 months to:

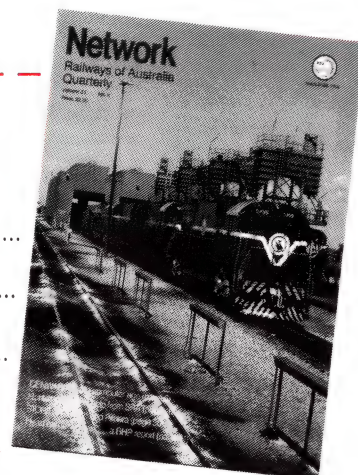
Name

Address

Postcode.....

Enclosed is my cheque/money order for \$12* being annual subscription.

(*A\$16 SURFACE MAIL OVERSEAS)



Britain tries new diesel for speed trains

Four InterCity 125 high speed train (HST) power cars are to receive new engines in a bid to increase reliability on British railways.

Under a contract worth around 750,000 pounds sterling (\$A1.5 million) awarded by British Rail to Mirrlees Blackstone (Stamford), four MB 190 diesels each rated at 1790 kW (2400 bhp) will be used for in-train trials to assess their suitability for rail traction duties.

British Rail's 125 HST units are some of the most intensely worked in the world, with many covering over 1600 kilometres daily.

The British Rail requirement is for an engine which can directly replace the existing diesel with minimum

modification to engine room layout, ancillaries and control equipment.

The twelve-cylinder MB 190 has been chosen to provide robust and reliable operation and long service intervals. The engine-driven pumps and turbocharger were relocated to suit the installation, and a power-take-off was provided to drive the cooling equipment.

The engine frame was modified to accommodate the existing traction alternator.

Preliminary trials on a six-cylinder development engine to simulate variable speed duties of the HST revealed a need for modifications to achieve reliable and efficient

combustion under these operating conditions.

As a result, the engine now incorporates an intensively cooled cylinder head flame-face and hardened valve seats to withstand the high thermal loading imposed by traction duties.

The engine also features a fuel injection system with variable timing to give optimum combustion over all operational speeds and load parameters.

The new-specification engine has successfully completed 300 hours of tests specified by British Rail, designed to impose a high thermal loading on critical components and thereby give confidence in a good in-service life for the unit.

...and looks at coasting for energy savings

An energy-saving system for diesel and electric trains which may reduce fuel costs by five per cent, is being tested by British Rail (BR) engineers in Derby, English Midlands.

The system, which tells drivers when they can safely 'coast' to save fuel without causing a delay on journey times, is known as TCAS (Train Coasting Advisory System).

It is being tested on five of BR's high speed InterCity 125 trains and eventually it is hoped to extend the system to cover some suburban services, where it is estimated to pay for itself within one year of normal operational use.

TCAS has been initiated by BR to assess the cost-effectiveness of using coasting to reduce traction energy consumption.

It is possible to use it as a means of fuel saving without causing significant delays in arrival times.

Using a handheld computer in the cab to monitor and control the system the driver can be advised of

exactly when and where coasting is permitted on a given route.

The computer is linked to a special purpose signal processing unit built around a 6809 microprocessor.

**'fuel savings
without causing
significant
delays'**

It takes inputs from various sensors mounted on a train to give information on speed and distance travelled and is preloaded with standing data relating to the route, expected train performance and timetable.

At the beginning of each trip the driver enters train and journey

details via the keyboard and the program automatically starts as the train departs. During the journey it correlates the pre-programmed information with the train data on speed and journey location being received from the 6809 processor and initiates a visual signal to the driver indicating when he can coast without delaying the time of arrival at the next station.

A large memory is required by the computer because the BR application program, written in PASCAL, occupies 72 K bytes, along with 32 K bytes of standing data.

The computer's serial port is used to transmit data relating to each train journey to a digital data recorder.

This allows the system to be operated for a fortnight at a time before it is necessary for the results to be collected - cutting down the time required for each experiment run.



National Trust discovers Sta

As the gold-mining and rural communities sprang up in northern and western Victoria in the second half of the nineteenth century, the railway tracks followed, bringing communities closer together and providing links between isolated areas and the civilisation of Melbourne.

Rail was the only reliable and cheap alternative to bullock drays that would take weeks and sometimes months to struggle through flooded rivers or across dusty plains to reach mushrooming gold towns with much needed supplies.

At regular intervals along the ever expanding track network, stations were built. These buildings invariably became centres for the communities they serviced. The telegraph and the steam engine were absolutes in a world of haphazard communication and often unserviceable roads.

The architecture of stations constructed during the period 1860-1910 reflects their status as important contributors in a developing society.

Many of these stations still stand today and in recent years, as interest in preserving our heritage has risen, many have been restored to their past glory or have been classified by the National Trust. There are some 34 stations in the V/Line network that have been either classified by the National Trust or placed on the register of historic buildings with national significance.



Graceful timber bracketed verandah on platform at Little River Station.

They range from tiny bluestone buildings in once thriving towns that are now little better than ghost towns, right through the gamut of architectural possibilities to splendid constructions such as the Ballarat Station, currently being restored by V/Line, which features rich, wood paneling and massive, carved stonework.

A fine example of the magnificence of Victorian architectural conception is provided by Maryborough Station, which has found its niche in literary history through Mark Twain's rather facetious description of it as "a station with a town attached". The railway arrived at Maryborough in 1874 from Castlemaine. In 1890,

work commenced on the remarkable station building that still stands today. Huge, imposing and opulently finished, Maryborough Station typifies the grandeur of railways in the age of steam.

The traveller to Maryborough today, rolling in to the long, canopied platform from a landscape of paddocks and grassland, might very well wonder what such an amazingly ornate structure is doing way out in the middle of western Victoria. There is much folklore and legend attached to the tale of why Maryborough Station was built. One theory suggests that the building was originally planned for Spencer Street, Melbourne, but through the



Above and right: Main platform, Maryborough Station; an ornate structure in the middle of Western Victoria.

treasures along the tracks



Meredith Station, a fine example of Victorian architecture.

persuasive tongue of an unnamed Maryborough politician the site was switched.

More picturesque, but less probable theories suggest that it is the result of some swift legerdemain on the part of an enterprising architect or engineer who changed the name on the original plans.

The most plausible explanation is also the most pedestrian. In the third quarter of the nineteenth century Maryborough was a prosperous gold-mining community and plans went forward to establish the town as the major rail centre of northern and western Victoria.

Unfortunately, the gold reefs petered out, policy changed and Bendigo

became the more favoured site for a comprehensive rail centre.

In any event, the station was completed in 1892 and it remains today a magnificent reminder of the plans and dreams of those who developed Victoria.

The exterior of the station features a massive columned portal. A 25-metre high clock tower, completed in 1914, rises above the ornate facade and slate tiled roof. The interior is breath-taking to the first-time visitor. Richly patterned tiled floors were laid down by Cawkwell's of Malvern, a distinguished firm of the period, which was also responsible for the tiled floors of many of Melbourne's finest churches, Parliament House and 'Stonington', long-time residence of the Governor.

Polished cedar ceilings, marble and mirror inlaid fireplaces, carved woodwork and glowing leadlight windows complement the station exterior in a show of outstanding architectural excellence.

At the other end of the architectural scale are the smaller, but beautifully constructed Italian-style station buildings that can be found at many sites throughout central and south-western Victoria.

Examples of these buildings, all built to similar pattern and using the same materials — the heavy bluestone quarried from basalt hills of the Great Dividing Range — are to be found at Malmsbury, Kyneton,



Stonework, north side, Station Master's residence, Meredith Station.

Little River, Lal Lal, Meredith, Carlsruhe and a number of other sites throughout this area of the State.

Malmsbury Railway Station was built as part of the original Melbourne-to-Sandhurst (Bendigo) trunk line, which was originally conceived as the main route to Sydney, via Echuca.

The station buildings have an informal character that is reminiscent of English country stations, on which they were modelled.

Meredith Railway Station is a similarly captivating set of buildings, constructed in 1862 from locally quarried basalt. The complex has a traditional, two-storey residence, lamp room and timber bracketed verandah.

Inside the station-master's office, things are much the same as they were at the turn of the century. The original signal handles and frame are still in place, as is the electric auto staff operating gear which has operated perfectly over the years and shows no sign of wearing out. The buildings constructed throughout the first half-century of railway activity in Victoria certainly were built to last. They remain today as testaments to the skill of stonemasons and craftsman builders. As well, they are reminders of the central role of the railway in the continual development of the State.



Local innovations app

Use of Computers becoming widespread in Railways

As stated by Mike Purcell, Chief Traffic Manager, Westrail "The axiom of the 1980's is that the techniques of digital computer and electronic communication will be the catalyst of a new quantum leap in industrial productivity".

This is particularly so for railways because these technologies offer large and complex transport organisations (like railways) a significant opportunity to improve their competitive position in relation to the fragmented but politically powerful road transport industry. Already computers are the most significant new technology to be widely introduced by railways. Computers of various sizes from mainframe to mini are now being successfully utilised in design, drafting and maintenance planning as well as general administrative areas such as payrolls and accounting.

New initiatives such as the Westrail Rolling Stock Control System (RSCS) have been successful and as a result the number of employees who are 'computer literate' in the railway industry is rapidly growing. The RSCS provides a good illustration of this.

Two years ago no more than 10 Westrail Traffic Branch employees

This new column, which will occur at regular intervals in 'Network' deals with technology, research and development. Too often 'new' technology is considered as something remote or long-term hence our title of 'at the workplace' illustrating that our emphasis will be on implementation of new technology and research by Australian railway systems, principally in engineering areas. Material for inclusion in this column should be submitted to the Editor.

had used a computer in the course of railway business. Today over 200 access the RSCS and this number is expected to double by the end of the year.

In research and development computers have enabled the analysis of large amounts of data collected by instrumentation (e.g., strain gauges, thermocouples, load cells, displacement transducers) and more complex and precise engineering calculations to be performed.

Most major railway research programmes now underway are dependent to some extent on access to relatively low cost computer resources.

In particular, mathematical modelling of vehicle behaviour and track performance is likely to lead to more general use of what are now research tools, in management decision making in the next decade.

An excellent example of this is the development of the SIMCAR computer-based vehicle simulation model.

The origins of the SIMCAR model go back to the early 1970's when the University of Adelaide, in conjunction with the then South Australian Railways produced an initial digital model of an eight-wheeled ELX (AOBX) freight vehicle. Development was limited by computer resources and availability of analytical software packages.

As a result Railways of Australia funded new development at the University in the 1980's which produced SIMCAR - a large fortran based software package that allows computer simulation of railway vehicle performance over a wide range of conditions.

Output is in the form of time histories for forces, displacements and accelerations, which data can

Figure 1

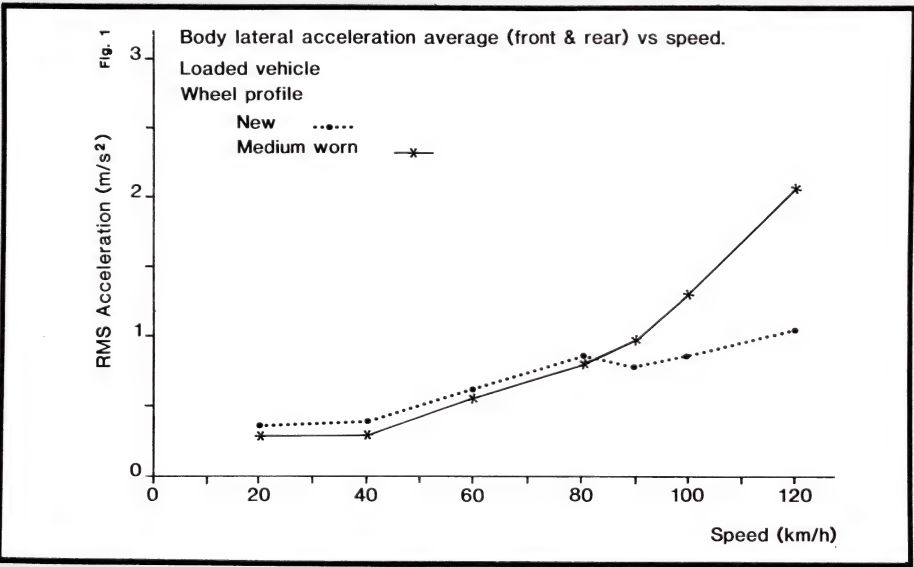
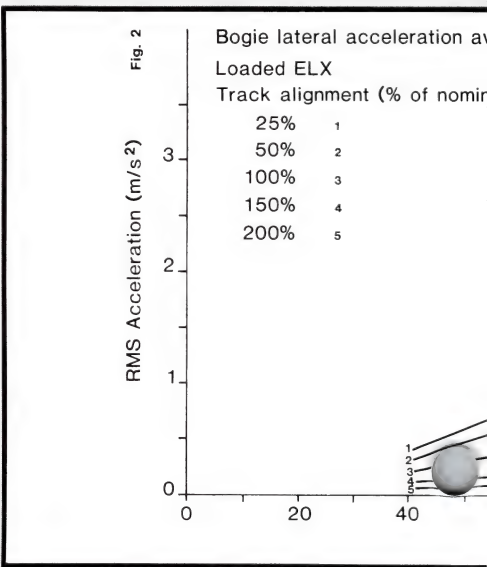


Figure 2



ied - at the workface

be manipulated to give a variety of statistical outputs.

As such Australian railways now have available a computer model which enables:

- the effects of different operating speeds
- the influence of track geometry (e.g., gauge, alignment); and
- various vehicle design features (e.g., centreplate friction, centre of gravity, wheel profiles)

to be assessed. Currently railway systems throughout Australia are installing this package on their computers for use in assessments of this type, and Australian National on behalf of Railways of Australia is undertaking further developments to allow a wide range of newer bogies to be evaluated.

Some outputs from the model are shown in Fig. 1 and 2. In Fig. 1 it can be seen that the lateral acceleration of the vehicle body at speeds above 80km/h starts to become dependent on the wheel profile in use.

While both wheel profiles are safe the potential for damage (rail wear, wheel wear, higher fuel costs) with the worn wheel profile is much greater at higher speeds under the particular circumstances examined in this simulation run.

Fig. 2 shows the influence of track alignment errors as the alignment progressively worsens from good (25%) to poor (200%).

It is interesting to note from this simulation run that bogie performance at 100km/h on good track is better than that at all speeds on poor track.

With the gradual upgrading of mainline tracks (using concrete sleepers in many instances) well underway, this model output indicates that higher operating speeds may be feasible giving railways a competitive edge over road transport.

The results also indicate that to travel in excess of 100km/h, despite the best track conditions available, may also require either improved bogies or modification to the standard three-piece bogie modelled here.

Higher speeds, although important in servicing customers do however have their disadvantages.

As shown in the Table energy losses and hence fuel costs - which are the largest external costs of railways - increase rapidly at higher speeds.

The cost of fuel per tonne of goods carried can however be substantially reduced by increasing the payload carried on rail vehicles.

Railways of Australia — Vehicle/Track Studies

Since 1978, under the auspices of Railways of Australia, the major Australian government railway systems have operated a joint technical research programme into the effects of vehicle/track interaction.

Current projects include investigations of wheel/rail profiles, track and rail design procedures, the development of dynamic vehicle models and track deterioration assessment. Other research and development areas are currently being considered.

These R & D programmes are carried out internally by railway systems and externally on a contract basis.

If you as an individual, academic, consultant or manufacturer wish to register an interest in conducting specific research and development activities on a contract basis with Railways of Australia support please contact Michael O'Rourke, Engineering Research Manager, Railways of Australia Committee, 325 Collins Street, MELBOURNE, VIC 3000. Telephone: (03)61 2545



(front & rear) vs speed.

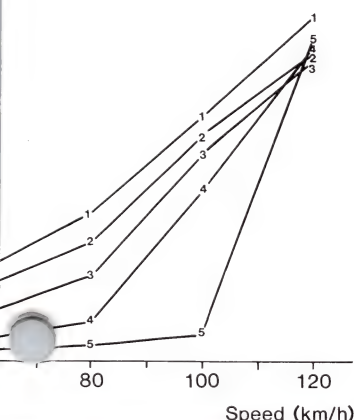


Figure3

Creepage energy factor as a function of loading corrected for distance travelled, payload.				
Speed (km/h)	Payload (t)			
	16.8	33.7	50.5	75.8
40	13	8.3	6.5	5.2
60	28	20	9.0	5.7
80	64	26	11	6.9
100	65	29	25	13
120	72	43	31	40

Most energy
effective
operating area.



The best is always the best value.

When you specify Timken tapered roller bearings, you've made an investment in reliability.

People have counted on The Timken Company's Authorized Distributor network for replacement tapered roller bearings for over 80 years.

They know that in the long run, the best is the best value. Because down-time can be very expensive.

At The Timken Company, the best begins with the case-hardened steel we use in our bearings. And continues right through to our exacting quality control and testing.

The best also means the best choice. Over 60 types and 26,000 sizes. Both inch and metric.

To be sure you're getting the best value, contact your dependable Authorized Distributor. Replace with Timken bearings.

Remember, the best is always the best value.

**IT'S NOT JUST WHAT WE MAKE.
IT'S WHAT WE KNOW.**

TIMKEN

REGISTERED TRADE MARK
TAPERED ROLLER BEARINGS

Australian Timken
Proprietary Limited
P.O. Box 240,
Ballarat, Vic. 3350



A smoother ride... on air springs

More vehicles are giving a smoother ride - thanks to air suspension systems using rubber diaphragms like these pictured at the Dunlop factory in Coventry, England.

The diaphragms, composed of a fabric-reinforced mixture of natural rubber and Neoprene, are sealed at each end to form air springs - extensively used on the suspensions of trains, buses and articulated vehicles to cushion vibration, saving passengers from discomfort and freight from damage.

Almost maintenance free, they are lighter and require less space than conventional spring systems.

Levelling valves are used to control the air flow in and out of the airspring assemblies - ensuring a constant platform height under all vehicle load and road conditions.

Dunlop is developing a new microcomputer-controlled system to vary the height and angle of the suspension so that high and low settings can be used to assist in awkward manoeuvres, such as entry or exit from ferries.

Industrial air bellows systems are also made to isolate vibration in heavy machinery and protect delicate equipment from the effects of shake.

The British manufacturer supplies air suspension systems to many parts of the world and custom built units for individual and advanced requirements.



A photograph of a white and orange State Rail EM20 diesel locomotive. The locomotive features a black and yellow striped front end and the text 'STATE RAIL' on its side. It is parked on tracks in front of a large building with 'AUSTRALIA' written on its facade.

Its powerful on-board data processing system produces exception, summary and track quality reports in real time, whilst storing all raw data for future reference. A wide range of standard software is available and specialised programs can be prepared if required.

MELI.PL.874

JANES DOES IT LIKE NO ONE ELSE CAN DO

Review "Janes World Railways 1985-86"

Edited by: Geoffrey Freeman Allen
Published by Jane's Publishing Company Limited

238 City Road London EC1V 2PU
England

Price £62.50. Over 900 pages.

The 27th edition of Janes World Railways endorses the reputation this authoritative volume already commands, and covers in a most comprehensive form the manufacturers, freight car leasing companies, international associations, consultancies, Railway Systems and all rapid transit, underground and surface railways throughout the world.

Major Australian manufacturers are well represented. Clyde tabulate diesel locomotive production since 1970, but the Comeng entry is better presented with ten halftone illustrations and informative but more limited tabulation. The Goninan entry is concise and straightforward.

Although listed, some other Australian manufacturers would appear to have been reluctant to supply any information, and the entries appear accordingly.

The section on Australian Railway Systems provides broad coverage and is crammed with useful data. If the Australian entry is indicative of the coverage given in other countries, Jane's World Railways must be regarded as the most detailed international analysis available in the world today. Some of the halftone illustrations are however very dated, with locomotives shown in old liveries, the most unfortunate example being the 1970 illustration of the inaugural "Indian-Pacific". Really, sixteen years out of date is a bit too much.

I hope our friends at Westrail will update this photograph for 1987! Overall Australian Systems have proved to be effective information sources for the publishers, although more recent personnel lists should have been available in some cases. The New Zealand entry is also comprehensive.

There can be little doubt that Janes World Railways is the most effective book of its kind, other volumes paling into insignificance in comparison. The sheer size and cost of the volume will restrict sales

but copies should be stocked by major public libraries.

One must continue to be impressed by the world wide railway industry in terms of size, capacity, investment, route lengths and number of employees.

Janes brings these matters to the readers attention as no other publication can do. Highly recommended for professional applications.

Our copy was supplied directly by the publishers, Janes Publishing Company, 238 City Road, London EC1V 2PU, to whom all enquiries should be directed.

Railway Economy

By D. Lardner

140 x 220 mm, 442 pp, text and tables only, hard covers.

Published by David and Charles, Railway Station, Newton Abbot Devon, UK. Price not stated but available from the publisher and through booksellers on order.

This has been a quiet quarter in books submitted to us for review. However, in view of the continuing extra-railway professional interest in transport planning, rail reorganisation, cost-cutting, rail reorganisation, rationalisation, and rail reorganisation it is opportune and necessary to draw the attention of those who advise us to the continuing availability of this important reference work.

Prepared by a famous British transport economist, the book is divided into 22 chapters. These deal with the economic importance of transport, the organisation of a railway administration, way and works, motive power, rolling stock and its maintenance, interchange with other modes at stations and arrangements for coordinating inter-system traffic (a most important issue in view of INTRANS and the new Interstate Commission).

Passenger and goods traffics are the next to be analysed (using British statistics) in considerable depth, with inputs from leading railway executives in the UK, and in two key Chapters (Nos 12 and 13) the author focuses on the vital financial issues of expenses,

receipts, rates and profits. Here he emphasises a hard-headed commercial approach to these matters.

The remaining chapters deal with the importance of applying the latest available communications technology to the operation and management of the railway, including an interesting application of secure communications to conventional wheat store equipment (page 305). There is a wealth of statistical information on railways in the USA and the Continent of Europe and some interesting material on safety issues.

There is also some useful advice to the consumer purchasing particular kinds of railway service (which **Network** will reprint in excerpt when future space permits).

The important issues of relations with Government and regulation are addressed in the final chapter of this definitive work.

While a carping critic could describe the author's style as a trifle pompous, and perhaps be irritated by his tendency to enshrine the reasonably-obvious into unnecessary algebric formulae, many of these formulae appear adaptable to economic modelling by computer.

And most non-economist railway readers whose job takes them through economic reports will find the book familiar managerial fodder, and not at all difficult to comprehend.

The book will be refreshingly instructive to planners, costing officers, consultants and economists in Ministries of Transport, the BTE, AARDO etc. to whom railway transport work is new.

Two cautionary notes should, however, be struck on the application of the book and the statistical data to current (1986) Australian conditions. The first is that data is drawn entirely from overseas; the second is that (being a reprint) the book is a trifle dated. Yes, **Railway Economy** is indeed described by its subtitle **A Treatise on the New Art of Transport**. And Dr Dionysius Lardner first published it in 1850.

Score love-fifteen, economists to serve.



New track machine an Australian first



The Plasser 09-16CAT, the first continuous tamping machine in Australia at work on the WESTRAIL system.

"Network"

WESTRAIL recently took delivery of a unique new track maintenance machine.

This machine is not only the first of its kind in Australia, it is the first of this new machine series in the southern hemisphere. 'C.A.T.' stands for Continuous Action Tamping, and it is the continuous nature of the machine's operation which makes it unique.

Conventional tamping machines have to stop and start (index) at every sleeper to tamp the ballast. At maximum production rates, the conventional machine has to repeat the work cycle every 2½ seconds or so, placing stress on the crew and the machine itself.

The mass of these machines, around 30 tonnes or so, means that it is simply not possible to start and stop them any faster, thus placing a limitation on their work rate.

With the 09-16CAT, this inherent limitation has been overcome by

adopting a new approach to the machine design.

The main working units, i.e. tamping units, track lifting and lining units, etc., have been mounted in a separate, remotely controlled unit called the "satellite".

This relatively lightweight unit, which is only some 20% of the total weight of the machine, indexes from sleeper to sleeper, whilst the heavy main body of the machine moves smoothly forward in a continuous manner.

This new concept provides very high gains in output, with tamping production rate increases in excess of 30% being gained.

As the control cabins are located on the main machine, the crew is no longer subject to the high acceleration and deceleration levels experienced in conventional machines, allowing them to maintain this higher production rate over longer periods of time.

Fuel consumption is reduced by up to 50%, and machine downtime is

reduced due to less strain on the transmission, brakes, mainframe, etc., and significantly lower vibration levels.

Whilst the Westrail machine may be the first CAT tamping machine in Australia, it is unlikely to be the last, with great interest already being shown in it by other railway systems.





Is a locomotive like this worth rebuilding?

As it happens, this one certainly is. But there are other times when a rebuild is the last thing we'd suggest.

It all depends on what's most economical, most cost effective for you.

The quality of GM locomotives is such that many of them are prime candidates for rebuilding, on the other hand, it may be time to invest in a new GM locomotive.

A locomotive which will do it easier, work harder for a longer period and dramatically improve the returns. The better power to weight, apart from greater tonnage per kilometre, will improve on-rail availability and lessen maintenance costs. Additionally crew accommodation is of today's standards and there is less smoke and pollutants.

Ask us for a no-obligation evaluation and a new motive power proposal. You can trust us to lay it right on the line.



**Clyde Engineering
Motive Power Division**

Clyde Industries Limited (Incorporated in N.S.W.)

Factory Street, Granville N.S.W. 2142
Telephone: (02) 637 8288.



The Classic Traveltrain Adventure



The
Queenslander

Brisbane - Cairns / Cairns - Brisbane

From April 20, 1986 Queensland Railways will offer the Sunshine State traveller a totally new class of Traveltrain.

"The Queenslander" is a limited express service which will follow the scenic Sunlander route between Brisbane and Cairns. Because of its limited stops, The Queenslander will run to a faster schedule than the Sunlander.

Departing Brisbane once per week and Cairns once per week, The Queenslander will feature a Dining Car, Lounge Car and comfortable private sleeping compartments for both first class and economy class passengers and piped music throughout the train.

While travelling at up to 80km/h, passengers may dine in the elegant

surrounds of The Queenslander's restaurant.

A special menu for first class passengers will offer a selection of exotic "Queensland" dishes, all expertly prepared by the Queenslander's travelling chef.

(continued on page 30)

style

A totally new class of travel train

continued from page 29

Meals are all inclusive for first class passengers. A separate a-la-carte menu will be available for economy class passengers.

Travellers will be able to take it easy in style in the elegant Lounge Car. The combination of Queensland timber paneling, brass fittings, stylish furniture and lush green plants provide a relaxed atmosphere that is perfect for a quiet drink at the bar, a friendly chat with fellow travellers over a cup of tea or coffee or even a movie on closed circuit television. Another feature of Queensland Railways' up market Traveltrain is the on-board MotoRail service which gives passengers the option of taking their private vehicles with them.

When you travel on The Queenslander you can take it easy in the lap of luxury, arrive at your holiday destination relaxed and refreshed, and drive off to discover a unique part of Queensland's beauty with the convenience of your own car.



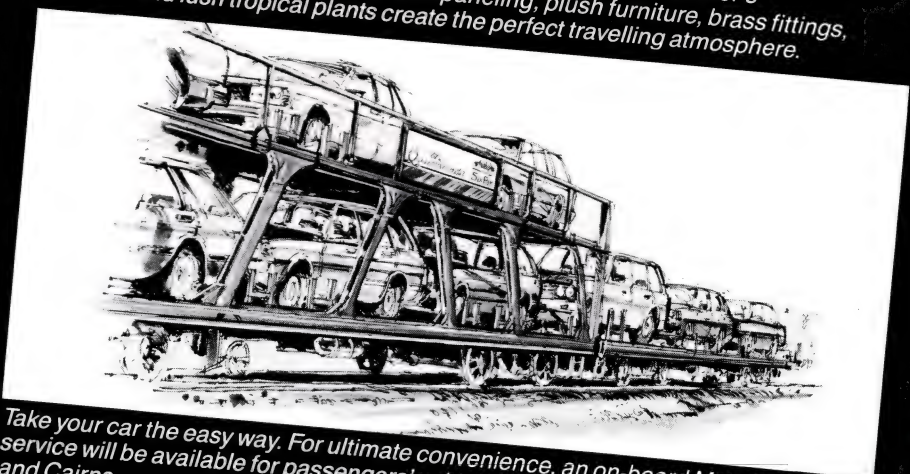
All aboard for the "classic" Traveltrain adventure. Inside the sleek blue and gold carriages passengers will find all the facilities that make The Queenslander the luxury flagship of Queensland Railways' fleet.



Dine in style in The Queenslander's restaurant. Passengers will enjoy exotic Queensland delicacies served at window-side tables.



First class passengers may relax with a cool drink in The Queenslander's exclusive Lounge Car. Queensland timber paneling, plush furniture, brass fittings, a TV monitor and lush tropical plants create the perfect travelling atmosphere.



Take your car the easy way. For ultimate convenience, an on-board MotoRail service will be available for passengers' vehicles between Brisbane, Townsville and Cairns.

MONORAIL SYSTEM FOR DARLING HARBOUR

A Von Roll-Habegger monorail line planned for Sydney will be the first example of a new rail technology in Australia.

The \$40 million system, is to be developed, constructed and privately operated by TNT Bulkships Ltd, will link the Darling Harbour redevelopment with central Sydney (see map 2).

The system could be completed by January 1988.

To be capable of carrying a crush load of 5000 people per hour, the line will connect areas insufficiently served by public transport, such as Pyrmont, Ultimo, the Entertainment Centre, Power House Museum and western side of the city.

It will also link vital attractions within the project, including the Exhibition Centre, Convention Centre, the National Maritime Museum, Aquarium, parks and gardens.

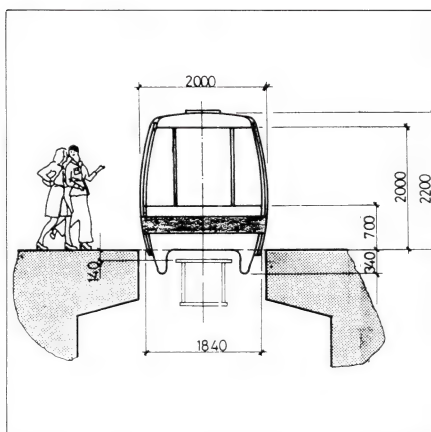
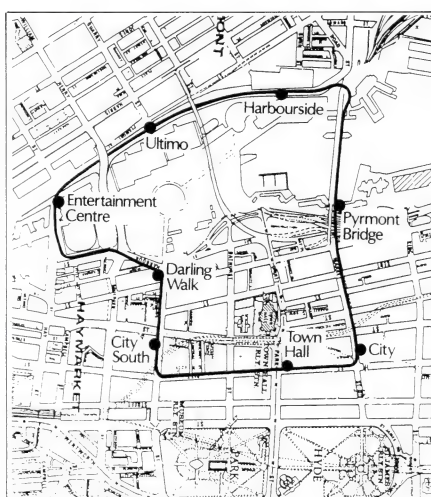
The Swiss designed Von Roll system is a fully automated electric powered straddle monorail which runs on rubber tyres.

If construction proceeds, the monorail will be placed in the kerbside lane and will be elevated 5.5 metres above the street. The supports will be spaced approximately 30 metres apart to allow landscaped parking bays beneath.

A total of eight stations will be provided, including five in the Darling Harbour redevelopment. The round trip will take approximately 12 minutes for the 3.6 kilometre route, at an average speed of 33 km an hour.

The TNT proposal was chosen following exhaustive evaluation of more than 20 transport schemes submitted after expressions of interest were sought for the Darling Harbour redevelopment.

'System will carry 5000 people per hour'



Detailed examination of technical, financial and environmental grounds narrowed contenders down to two proposals - the TNT Von Roll system and a more traditional, but nevertheless modern light rail (tram) line suggested by Transfield/Comeng.

The NSW Government decided against the tram proposal on a number of grounds including the problems caused by a seven metre wide dedicated pathway needed by the tram in already congested, narrow Sydney streets.

The monorail, based on the Vancouver Expo '86 line which is in its final commissioning stage, was chosen by TNT on the basis that it would be 'small; unobtrusive and capable of tight turning radius'.

Carriage construction will consist of a welded aluminium frame covered by an aluminium sandwich material to provide excellent rigidity. Doors are to be two panel, centre opening, allowing two persons to enter or exit simultaneously.

Carriages will be provided with position indication, airconditioning, intercom to the main control room and emergency lighting. It is intended to build the basic carriages and drive units at Von Roll's factory in Switzerland.

Final fit-out of the carriages will be carried out in Australia. Normal train load will be 130 passengers.

The track design uses a fabricated steel box section with overall sectional dimensions of 70 cm (27") wide x 80 cm (31") deep for spans up to 30 m (98'). The track will be supported by about 120 columns.

Efforts are being made to extend local content of construction beyond the 70 percent level.



'A total of eight stations to be provided'

'Normal train load will be 130 passengers'



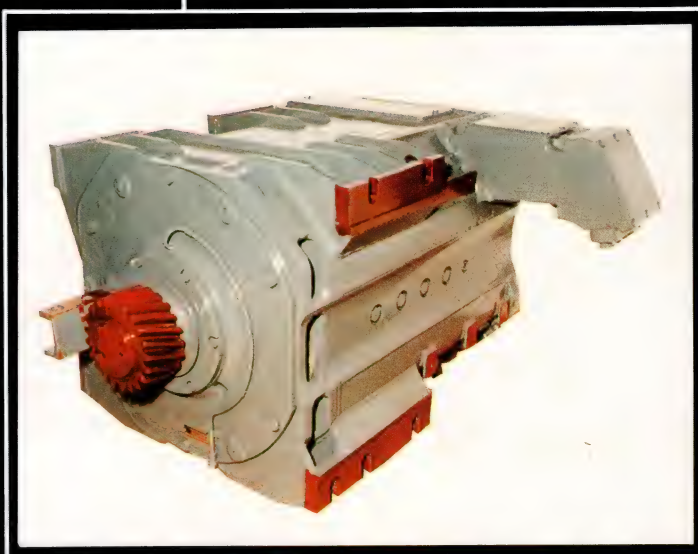
USA TURBOTRAIN

CARACAS - Chopper



A COMPLETE

SYNCHRONOUS LOCOMOTIVE



Traction motor

33, quai de Dion Bouton
92814 PUTEAUX Cedex - FRANCE
Tél. : (1) 47.76.43.64 - Télex 630756

fran

ANF - CAREL FOUCHE - DE DIETRICH - JEUMONT SCHNEIDER - MTE
are members of FRANCORAIL

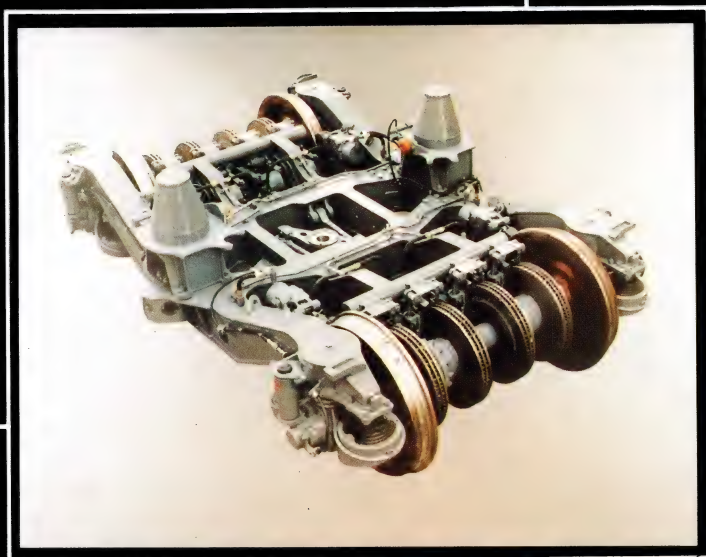
THE F

Z2N - Static inverter



PARIS AREA DOUBLE-DECK

POWER LINE



TGV - Trailer bogie

TGV PARIS SOUTH-EAST



corail

I.E.S.C. - 127 Macquarie street
SYDNEY - AUSTRALIA
Tél. : 27.30.12 - Télex AA26161

RTNER

SRA station redevelopment underway

Work is well underway on the \$2.5 million upgrading project for the SRA Hornsby station. The upgrading, which should be completed by next July, is part of the SRA's \$16 million program of major works at railway stations. Other projects include Town Hall, Wynyard, Redfern, Parramatta, Wollongong, Lidcombe, Auburn, Burwood, North Sydney, Museum, St. James, and Strathfield.

The new building will feature:-

- verandahs on either side — one acting as a walkway connecting with the covered George Street overpass and the Pacific Highway exit, and the other as access to the platforms;
 - a booking office with four instead of the present two ticket windows;
 - a small travel centre;
 - toilets (including facilities for the disabled and a baby change room); and
 - two shops.
- The stairs leading down to the platform will be covered and all

**\$16 MILLION
PROJECT
RIGHT ON
SCHEDULE**

four platforms have a full-sized awning for about three-quarters of their length.

- At the northern end of the platforms, covered walkways will lead to a covered platform access bridge.
- The kiosk on Platforms 2 and 3 will be refurbished as well as the toilets on Platform 4.
- Indicators will be installed in the main building on the bridge and there will be at least two on each platform.

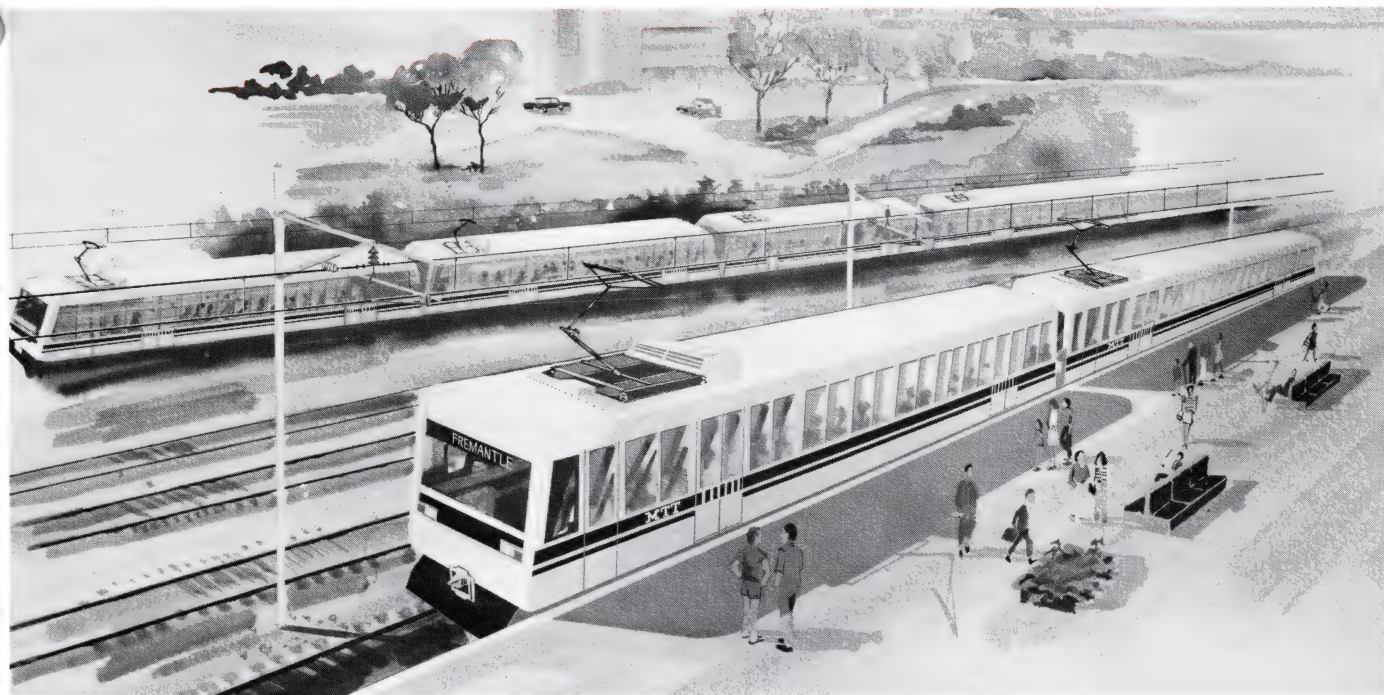
The upgrading work has been planned so as not to infringe any air space that may be used for future developments, and provision has been made to accommodate another three sets of railway tracks which are expected to be laid when the Hornsby Yard is upgraded. The contract also allows for landscaping on the station and platforms, and all the walkways and platforms will be tiled.

A proposal to develop the seven-hectare land and air space fronting George Station and Jersey Streets, would not go ahead because of a number of deferrals sought by the original developer.

The possibility of developing the site in the future has not been ruled out, but because of the pressing need for improved facilities it was necessary to take immediate action.



An artist's impression (aerial view) of work to be carried out on Hornsby Station under the SRA's major works program on station redevelopment.



Perth suburban system to go electric

The Western Australian Government has announced its intention to electrify the narrow gauge (1070mm) Perth suburban rail system at a cost of \$146 million.

The decision followed a report of a committee of enquiry into electrification set up in May 1984. The network consists of three routes radiating from the city: to Fremantle (19km), Midland (16km) and Armadale (31km).

Planning for the project has begun and the first electric trains should run in early 1989.

One of the main influencing factors was the current rolling stock the age of which is about 18 years. About three quarters of the existing railcars need to be replaced within nine years.

If the suburban passenger railway system is to continue to provide the required level of service, then major expenditure is required, whichever alternative is chosen, to replace most of the existing diesel fleet.

To replace the diesels would have cost at least as much as the total capital cost of the electrification, including new electric cars.

The operating and maintenance costs of the electric system, however, would be considerably less than that for the diesel fleet, about \$488 million compared with \$574 million over the period 1985-2020 at current values.

The reporting committee reviewed various heavy rail, light rail and new technology options.

At present a 25kV AC heavy rail system running on narrow gauge is the most likely especially as a decision on mainline electrification is yet to be made.

The reporting committee saw no reason to standardise the gauge of the predominantly isolated system. However, the necessity to use part of the Armadale line for freight traffic and Bunbury country services led to a recommendation to retain heavy rail instead of changing to light rail. Should it be feasible to run light rail in conjunction with the freight traffic, then consideration may be given to a 1500 volt DC light rail system. Costs of installing and using 1500V and 25kV electrification in the Perth situation are approximately the same.

The intention is to adopt the most cost-effective existing, proven electric technology on a 'no-frills' basis. Implementation is to be staged in three phases, with the Midland line to follow Fremantle, and the last and biggest task being to electrify the Armadale line.

The reason for this sequence is that the Fremantle line requires the fewest railcars so the project can begin there at the earliest. No track or signalling works are anticipated that would not have

been required for continuing diesel operation.

The report also recommended against new technologies such as mag-lev. and linear induction motors and air cushion vehicles.

The advantages of conversion to the standard gauge (1435mm) system on the three lines were more than offset by the high capital costs involved.

Previous studies have suggested the following additions to the ground system at some future time, when considered warranted:

- Extension of the Perth-Fremantle line to Rockingham.
- A new line, Perth-Joondalup, for which a right-of-way provision has been made in the median strip of the Mitchell Freeway.

The overriding consideration at the present time is the need to re-equip the existing suburban rail network rather than to extend it. Extensions would involve high capital cost. The report recommended that any such future extensions to the suburban rail network should be justified separately and are not expected to affect the current recommendations for the system.





WE MINE THE ORE. WE MINE THE COAL. WE MAKE THE STEEL. WE MAKE THE RAILS. WE MAKE THE SLEEPERS. WE RESEARCH THEM. WE TEST THEM. WE OPERATE RAIL LINES. COULD WE DO ANY MORE?

BHP's experience in every facet of the design and manufacture of rail tracks would be hard to equal, anywhere.

The first steel we made we made into a rail, (and we've been making rail ever since).

Today we're making a wide range of railtrack products which all share one quality: every one of them is designed to make rail a more efficient alternative to other means of transport.

Rails for all traffic

Our rail plant at Whyalla is amongst the most modern on earth. It was completed in 1983

and is producing rails which are the equal of the best made anywhere.

Universal rolling results in improved surface quality, reduced internal stresses and improved dimensional accuracy. Roll straightening also produces consistently straighter rails than older methods.

Ultrasonic inspection provides a guarantee of internal soundness over the complete length of each rail.

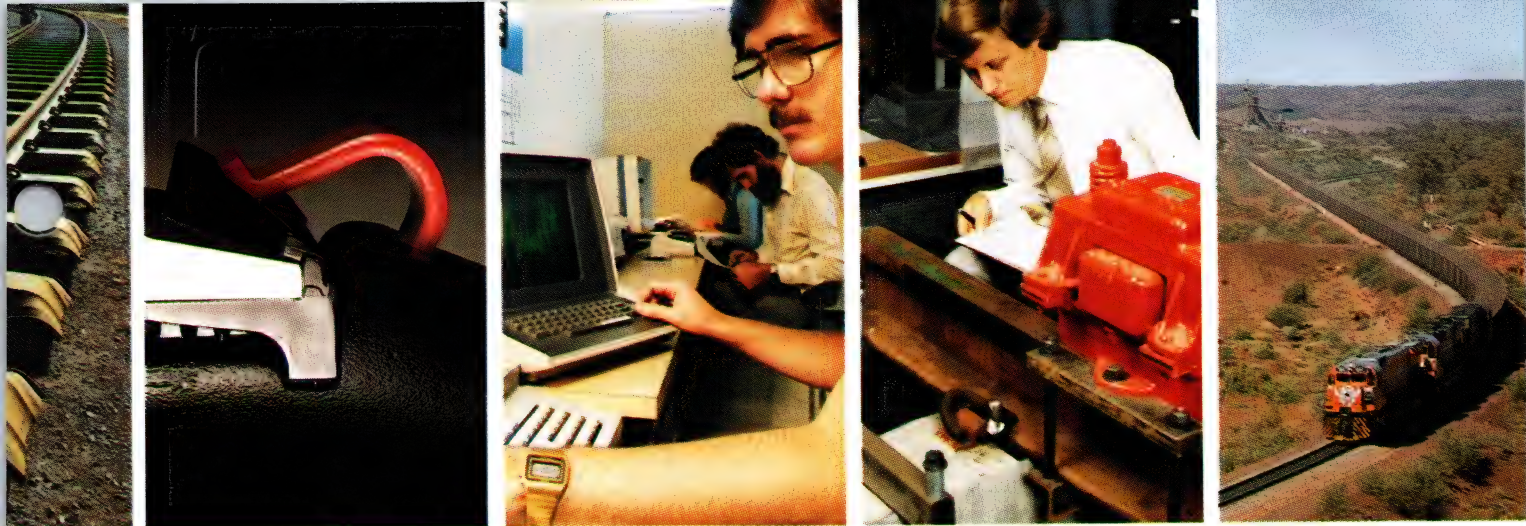
Lengths up to 27.4m are available.

Head-hardened rails for high-specification lines.

BHP's head-hardening techniques extend rail life by 100% or more. Head Hardened Rails are thus ideally suited to high wear and expensive replacement situations.

Their high strength and long fatigue life particularly suit them to uses involving heavy axle loads, curved track or restricted access locations.

The head of the rail is heat treated by a two-stage induction process followed by a high pressure air quench. This results in the formation of a fine pearlite



micro structure which provides superior hardness, strength, ductility, wear properties, and fatigue behaviour compared to standard carbon rails.

Head-hardened rails have now demonstrated their value over the 430 kilometre Newman to Port Hedland line, under axle loads of 32.5 tonnes and approximately 50 million gross tonnes per annum, at the BHP Slab & Plate Products Division where 50 tonne axle loads are carried on 60 kg head-hardened rails; at the Kooragang Coral Loader, with 25 tonne wheel loads; and on coal lines in several States, including the SRA's main line in the Hunter Valley, the most heavily trafficked coal line in Australia.

The future of sleepers is steel
Sleepers manufactured from BHP steel owe little to the steel sleepers originally designed in Europe half a century ago. They are engineered for today's traffic demands; and they cost less.

Steel sleepers are designed to absorb the shocks of heavy axle loads. They will not spall and break down as concrete will.

Steel sleepers are cheaper to install and will outlast timber. A gang laying 200 timber sleepers a day will lay 500-600 BHP steel sleepers directly on the formation.

Steel sleepers can be specified for a working life of up to 50 years; and there will be no losses to termites, rot or fire.

While lighter in weight than European designed steel sleepers, sleepers manufactured from BHP steel are designed to provide improved section properties, improved track stability, reduced bearing stresses and reduced sleeper ballast.

The reduction in weight also enables easier track installation

and repair. Steel sleepers are light enough to be man-handled, eliminating the necessity for mechanical assistance for repairs. Reduced weight also significantly reduces sleeper unit cost and transport expense.

Even when using 30% less ballast than timber, steel sleepers offer greater stability.

When required, an insulation system developed and proved by BHP provides over 20,000 ohms resistance between rail seats; superior to both timber and concrete.

There is also a full range of economical, maintenance-free, elastic fastening systems available which further reduce laying and maintenance costs.

BHP steel sleepers are available in four different types. The lightest is designed for uses such as those in the sugar and underground mining industries, the heaviest for some of the heaviest usage anywhere: at Mt. Newman and within BHP's Steelworks. BHP steel sleepers, have been proven in use, all around Australia.

Solving today's problems, developing tomorrow's breakthroughs.

BHP's Melbourne Research Laboratories (M.R.L.) is one of Australia's leading centres for product and engineering research.

It is a world leader in high density, heavy haul railway technology.

A multidisciplinary team of mechanical, civil and materials engineers works in close liaison with railway operators and components manufacturers. The group develops and tests components, vehicle and track performance and maintenance practises. These studies then form

the bases for technical and economic models designed to ensure cost-optimum solutions to operating problems; and for management judgement of the consequences of changing operational and financial factors.

M.R.L. have contributed to making major advances in rail and wheel performance, sleepers and their fastening and insulation systems, wheel/rail interactions, vehicle dynamics, track design, track and vehicle maintenance economics, rail and track maintenance management and wheel maintenance management.

The services of the Laboratory are available for trouble-shooting in installation and maintenance problems, to assist in developing specific solutions for specific problems and for the development and application of technical/economic analytical procedures which enhance decision making processes by management.

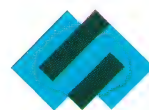
A century's commitment to rail

From its very beginning, BHP, has been closely involved in the development of Australia's railways.

As users, as suppliers and as operators.

Our commitment to rail is unquestioned.

As is our commitment to continue the work to make rail more efficient, more effective and more competitive.



**BHP
Steel**

International Group

**Long Products
Division**

unprecedented

Railways rev up in Queensland

By Brian Pascoe

Right: This 'aerial' view taken from above the developer's offices adjacent shows the main section of the shopping centre floor being poured. The station is immediately behind with the car park at left. Behind that is the Brisbane River and some of the City's high-risers can be seen in the background...approximately 4½ km away.

Below: Work goes on for Q.R. (despite high-rise development on it's 'door-step') as track is re-aligned.

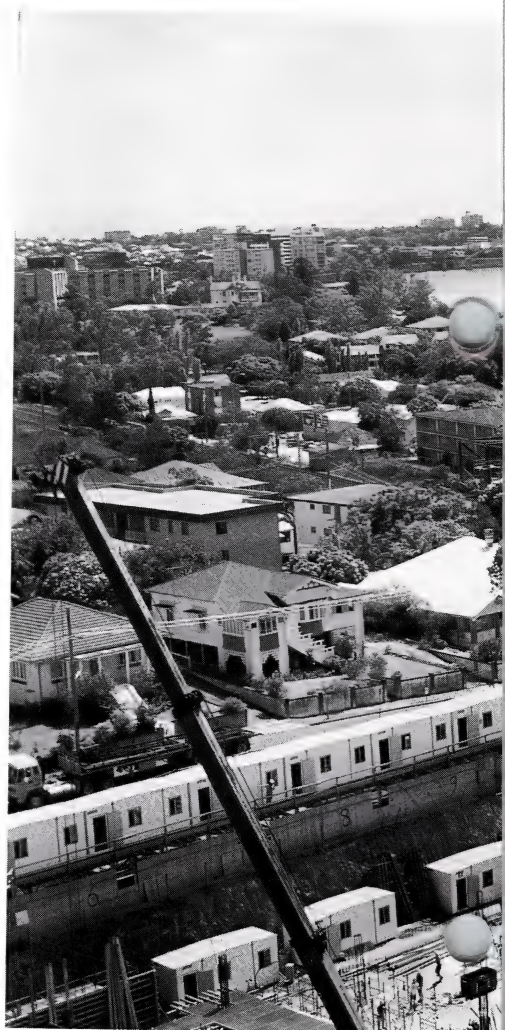
Queensland Railways, its moral lifted and still buoyant after the announcement of its record \$107 million operating profit in 1984/85, is poised to experience a year of unprecedented development.

Railways, not so long ago the forgotten mode of public transport and destined, many predicted, to become obsolete by the turn of the century, has got its second wind.

Even those who claimed railways freight operations would be replaced by road transport have been embarrassed by the iron horse's stamina and ability to compete favourably in a market being deregulated progressively.

Among those who were convinced railways had not run out of puff was Queensland's Transport Minister, Don Lane, who this year, will proudly watch an ambitious railway development programme come to fruition - development that is valued at \$170 million in Brisbane alone.

Added to the Brisbane development will be the commissioning of the first electric services on the massive \$700 million Central Queensland main line



electrification project - a project that is going to have huge advantages for Queensland's coal industry and the States overall economy.

Among the Brisbane rail projects to be completed in 1986 is the \$50 million Roma Street Development, to be known as the Brisbane Transit Centre.

The centre will be a multi-modal interchange accommodating inter and intra-State trains and coaches, local tour and charter bus operators, taxi ranks, commercial offices in two towers of 12 and seven stories, a 12-floor hotel with 192 rooms, licensed bars, restaurants and convention area, retail shops and short and long term parking areas.

As spectacular as the Roma Street development will be, Toowong Village, a \$52 million project utilising air space over the Toowong railway station.

Other railway station development to be completed this year includes new stations for Bray Park and Carseldine on the Petrie line, and a new \$1.2 million station at Boondall to cater for patrons to the new Boondall sports

and entertainment complex to be opened this year.

The Bray Park station, adjacent to the Pine Rivers Primary School just north of Samsonvale Road, and the Carseldine Station, adjacent to the Beams Road level crossing, will cost some \$1.4 million.

Electrification of new and existing suburban lines will continue this year with the commissioning of the new \$12 million link from Thorneside to Wellington Point, and the \$27 million electrification from Petrie to Caboolture.

At Acacia Ridge, a new \$26 million freight yard and freight forwarding facility, to include an electronic weighbridge, will be completed to handle inter and intra-state traffic and transfers from road to rail.

Rail passengers travelling to North Queensland will enjoy greater comfort and convenience with the introduction of the new luxurious Queenslander train to be introduced on the Sunlander route, and interstate passengers will be able to travel directly into Roma Street Station (instead of being forced to alight at South Brisbane) when the standard

gauge is taken across the river via the Merivale Bridge.

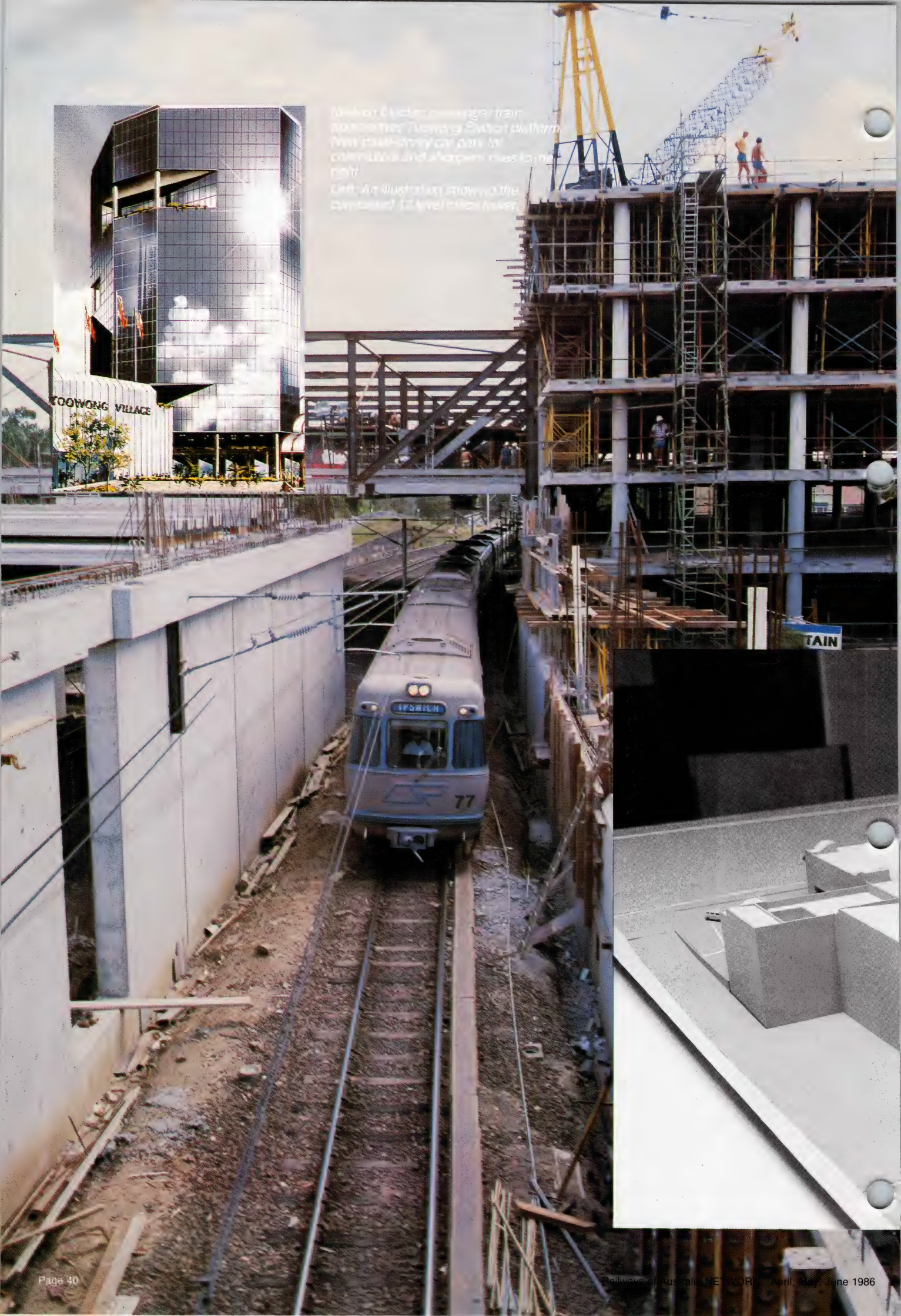
While a huge amount of track, signalling and electrification work already has been done on the massive \$700 million main line electrification project in Central Queensland, more visible evidence of progress will be seen this year with the commissioning of electric services from Gladstone to Rockhampton, and from Jilalan to Hay Point.

Transport Minister Lane said city people, and country visitors, would have the opportunity to examine the new electric locomotives to be used on the Central Queensland lines at this year's exhibition, shortly after they are handed over to Queensland Railways by the Contractors.

Another important development to occur in Central Queensland this year will be the introduction of train services on what has become known as the missing link - Clermont to Blair Athol.

The line will give grain producers in the area alternative ports, Gladstone or Hay Point, through which to export their crops.





Below: Electric passenger train
approaches Toowong Station platform.
New passenger car park is
constructed and a new bus lane
built.
Left: An illustration showed the
development of level access to the
platform.

Queensland Railways Toowong property development takes off

The Brisbane suburb of Toowong, some 4½ km from the G.P.O., is rapidly being transformed by a \$52 million redevelopment over a three hectare site, which includes air-space over the existing Toowong Railway Station and 4-track Main Line, other railway lands, a former sawmill site and other private properties.

Under a development agreement between Queensland Railways and Tarlana Pty. Ltd., a joint venture between financier, Australian Guarantee Corporation, and the builder, Girvan Bros., the Toowong Railway Station is being redeveloped to provide improved facilities for rail commuters.

The Toowong Station Development Agreement also provides for major external roadworks designed to improve road traffic flow through the Toowong area, and enhance the safety of pedestrians.

These works, with an estimated cost in excess of \$2 million, are being

funded by the Developer and include:-

- Two grade-separation structures to allow pedestrians safe access over Benson Street and under High Street.
- Widening the High Street road overbridge from 3 to 6 lanes.
- Road widening and associated channelling and signalling in Benson, High, Bennett and Lissner Streets.

However, the major components of the Toowong Village development are the shopping complex and a 12 level office tower.

The shopping complex will feature three levels of retail space including David Jones Department Store, K-Mart Discount Department Store, Coles New World Supermarket and approximately 70 speciality shops. Also to be provided are a new enlarged Australia Post facility, a community centre and medical facilities.

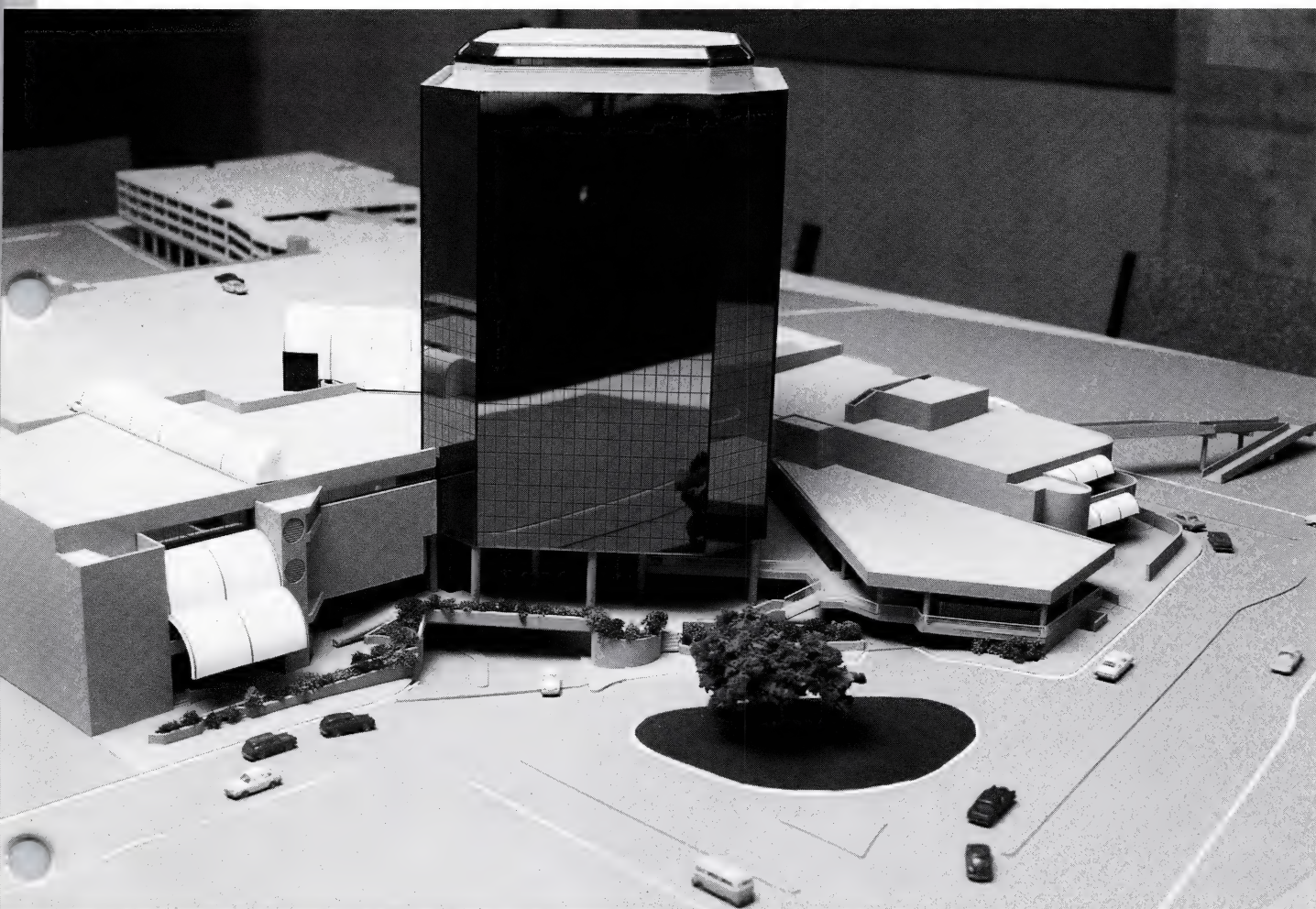
A 1600 space car park, mostly undercover, will service the complex. Gross floor area of the total complex is 106,000 square metres. Site works commenced in June 1985 and are

now progressing satisfactorily. Some delays were experienced in obtaining vacant possession of some areas of the site, and poor foundation and weather conditions also hampered construction.

The work over and around the railway and station has also been impeded for railway operational and safety considerations.

This entailed a significant amount of midnight-dawn work then the 25,000 volt overhead electric system could be shut down.

Anticipated completion dates for the major works are: New station facilities and roadworks - July 1986; Retail complex - October 1986; Office tower- March 1987.



A preview of how the finished Toowong Village Development will look. This aspect from the Sherwood Road/High Street side...station entrance at far right.

CLYDE'S

Clyde Engineering, headquartered in the Sydney suburb of Granville, has been linked for more than 100 years with the growth of Australian and overseas railways.

In its first 45 years Clyde built 533 steam locomotives; less than 29 years later its tally of diesel electric locomotives had reached 1000.

An important part of its production has been the design and manufacture for V/Line of the N Class diesel electric locomotives now being assembled in the Victorian plant of Clyde at Campbellfield.

Clyde also makes passenger cars for electrified suburban systems.

These have included the Harris blue trains for the Melbourne metropolitan network, built in the 1970's, and, in association with Hitachi, the stainless steel cars used by MetRail.

The company now has manufacturing plant and sales consultancy offices in most mainland States.

Clyde Engineering had its origin in a joinery shop built by carpenter William Henry Hudson at Redfern, NSW, in 1855. Among his achievements are the interior and furnishings of St Paul's church in Redfern and woodwork for the Great Hall in Sydney University.

Hudson's business grew, became mechanised, and when he retired in 1867 his two sons carried on the firm doing occasional railway jobs such as small bridges, siding and settlers' cottages.

In 1876 they won a contract to build 200 D Class goods wagons. This order was quickly followed by orders for livestock wagons, coal trucks and passenger carriages.

In October 1898 the Clyde Engineering Company was formed and purchased the Hudson Brothers' operation at Clyde, and, late in 1905, received its first order from the NSW Railways for 60 steam locomotives. By 1923, K Class locomotives were being delivered at an average of one a week; 310 were built.

Production of other famous steam Classes followed. Among the most notable were the streamlined C38's, five of which Clyde built between 1943 and 1945.



Clyde's Engineering Manager, David E. Butters (left) discusses locomotive design with a colleague.

RAIL

An agreement between Clyde and the Electro-Motive Division of General Motors Corporation, USA, in 1948 licensed Clyde to make and sell main line diesel electric locomotives in Australia.

The arrival of diesel power in the 1950s enabled Clyde to look at the needs of private industry. The company has been successful in supplying locomotives to BHP, Portland Cement, Western Mining Corporation, Comalco and Hamersley Iron.

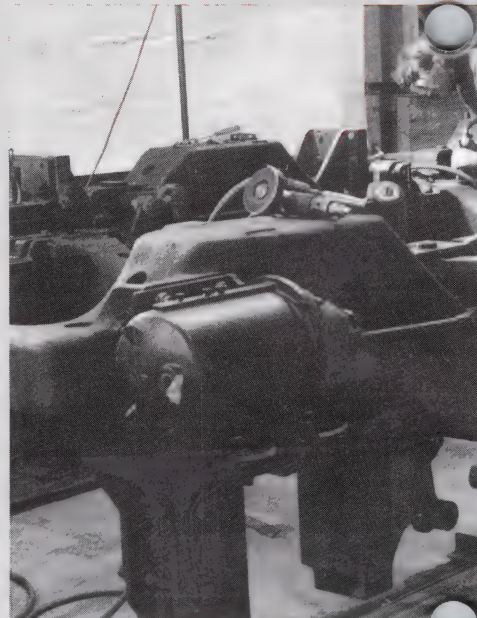
This led to Clyde's supplying narrow gauge lightweight diesel hydraulic locomotives to the Australian sugar industry, with more than 110 units having been sold.

As well as its enormous activity in locomotive construction, Clyde Engineering has built a flourishing business in rebuilding and refurbishing locomotives — an activity that has been reflected as a valuable part of its export business. Clyde is now licensed to ASEA for the manufacture of electric locomotives.

Clyde Engineering notes with pleasure the early association with the company of some Australian personalities.

These include the poet and writer Henry Lawson, whose portrait and work are featured on the \$10 note, and the loved character of Australian film and theatre, Chips Rafferty.

A powerful new diesel-electric locomotive of unusual and substantially Australian design made



An 'N' class sub-assembly takes shape.

LINKS

its appearance on Victorian track late last year.

It is the N Class locomotive, built at Campbellfield by Clyde Engineering, and may be described as dumb-bell shaped.

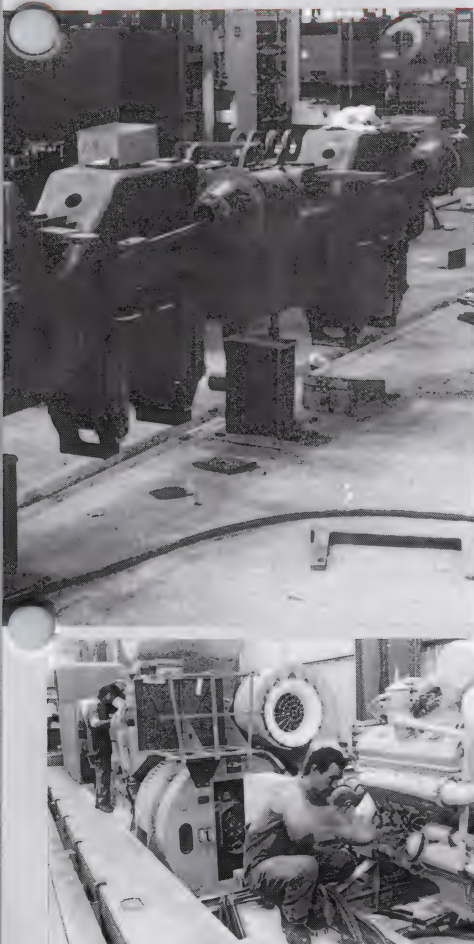
The N Class has wide control cabs fore and aft, connected by a long, narrower central engine section.

The first three off the production line were delivered to V/Line in September and October in a program that called for 25 to be produced by early 1987.

The design, largely the work of Clyde's Engineering Manager at Granville, N.S.W. David E. Butters, has functional advantages.

These include:

- control from either end — saving operation time by obviating the need to turn the locomotive around the terminals;
- size of cabs allows an instructor, when needed, to be carried comfortably in addition to the two-man crew;
- ease of servicing — the narrow engine body enables a catwalk to be constructed along each side, giving ready access to the engine components through fold-back body panels; and
- time saving on maintenance — particularly in summer when locos get hot and have to stand to cool



Fitters work the generator and motor on an N Class frame.

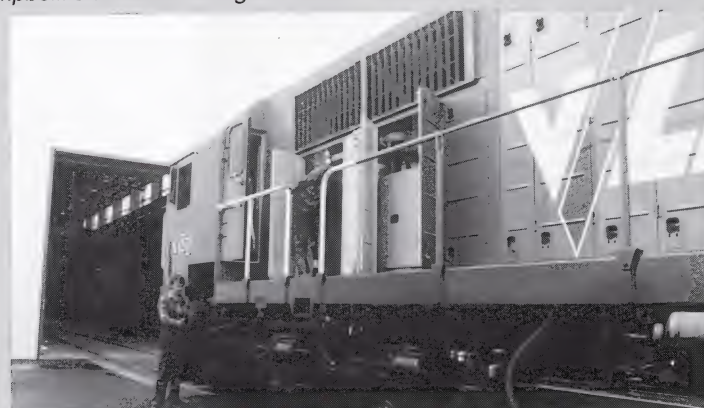
SPAN

off before maintenance work; the N class openable side panels speed up the cooling time. In finalising design of the cabs' interior, V/Line management received valuable input from the Cab Committee of the Australian Federated Union of Locomotive Enginemen (AFULE). V/Line's Manager Vehicles Engineering, David Ferris, said: 'Their input was very significant. They reviewed all our designs especially in relation to seating, layout of controls, and noise levels. The AFULE committee made their contribution at the time when we produced a mock-up of the cab. In future designs, they will be brought in even earlier — perhaps at the start of the project. Valuable contributions were made also by staff from the South Dynon Maintenance Depot, who reviewed designs and frequently visited the



Skilled welders at Campbellfield ensure strength of N Class frames.

A



Side panels open for engine inspection.

CENTURY

plant during construction. Clyde was extremely co-operative in this matter.' Cab design includes many safety features, such as an anti-climbing beam across the front of the cab to

prevent upward movement should a collision occur with another vehicle. Dual-bladed windscreen wipers on

(continued next page)



The first N Class engine nears completion, the first of 25 due for progressive delivery by 1987.



The first delivery of the N Class diesel was made to V/Line in September last year.

each windscreen glass give good visibility in bad weather, and windscreens and side windows are of high-impact-resistant material to improve crew safety.

Great attention has been given to ensuring that the crew has full ability to see and hear what is going on, and the cab is equipped with the latest vigilance control system to ensure that the crew is alive, well and alert.

The designation 'N Class' is making a reappearance in Victoria. It was formerly that of a steam locomotive class which finally disappeared from service in 1966.

The new N Class will enable V/Line to phase out older diesel locomotives such as the early Ts and perhaps, some Ys. Within the next year or two it will make a start in phasing out the B and S class locos.

Operating at present only on broad gauge tracks, but with potential for conversion to standard gauge, the N Class has a normal maximum operation speed on mainlines of 115 km/h when used on passenger trains and 90 km/h with freight.

Some of the specifications (in round figures) are: mass — 120 tonnes; length — 19m; height — 4m; width — 3m; fuel capacity — 6800 litres. As well as being used for passenger and freight trains throughout Victoria, the N Class will be able to operate on Melbourne-Adelaide broad gauge line, and its fuel capacity would

enable the run to be made there and back without refuelling.

The N Class is rated as 1678 kW (for traction), with a continuous tractive effort of 260 kiloNewtons, making it fully capable of pulling a train weighing up to 900 tonnes up normal gradients. With a long train such as the Overland two N Class might need to be used to maintain running schedules on some of the adverse gradients.

The N Class is more powerful than V/Line's X Class but less than the C and G Classes. It is markedly fuel efficient, using probably 25 per cent less fuel than comparable older locomotives.

With the diesel-electric system, as used by the N Class, the diesel engine powers an electric generator which drives electric motors whose torque is transmitted to the locomotive's driving wheels. This, in the mechanical design of the N Class gives it a smooth, quiet drive.

Mr Ferris said: 'The mechanics of the locomotive waste very little energy and do not require much maintenance. The N Class has a very high starting tractive effort.

When the loco is at a standstill, full power from the engine can be applied, giving the train a high starting force.

Overall, the design is something quite new to Australia although it incorporates features that have been used before. The electrics for the N

Class were designed in the USA at the Illinois plant of General Motors; also, American design is incorporated in the diesel engine and the electric motors.

The electric motors are being made by Clyde at its Bathurst factory, and Clyde is now exporting them to the USA. The American-designed bogies are made here also; so are the bodies, the underframes and a host of small components, making it very substantially an Australian application of both locally made and imported componentry.

The air conditioning units used were developed and manufactured by Sigma, an Australian firm.

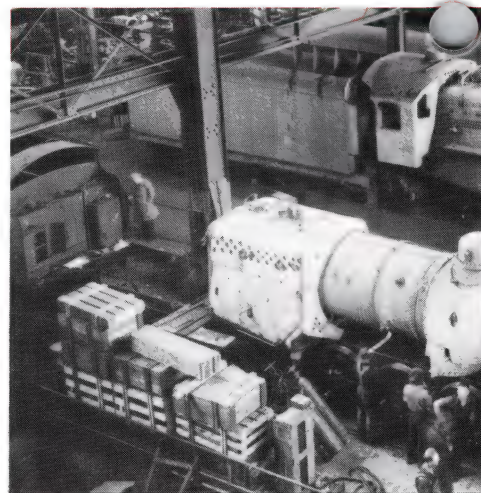
In its shape the N Class is not streamlined because, Mr Ferris said, the speeds at which it runs would not be significantly affected by streamlining. He said: 'It would probably be necessary for us to think about it at speeds of more than 150 km/h'.

Widespread use has been made of electronic components rather than the old type of electrical relays, and the electronic modules are virtually maintenance free for the life of the locomotive. They have the advantage that if something goes wrong a small light appears to tell the driver or maintainer exactly where the fault is. Running repairs can then usually be done quickly and easily.





A Garratt and a C 38-Class being fitted out prior to testing.



C 38 locomotives ready for road test with two ot in the foreground).

CLYDE'S C38s: MACHINES

Few experiences are as soul stirring as the sight and sound of a steam locomotive panting up the Hawkesbury hill on a winter morning pulling the Newcastle Flier or barrelling across the Southern highlands at the head of the Melbourne Limited Express.

From the late forties to the sixties, one locomotive was synonymous with these important express passenger trains - the streamlined C 38 built by Clyde Engineering.

Clyde Engineering produced its first steam locomotive in 1907 and in the ensuing half century produced many hundreds for Australian and overseas railways.

Among these were the NSW D57 heavy freight loco, generally regarded as the most powerful non-articulated locomotive in Australia, the NSW C 36 passenger loco, of which 75 were built, and the Commonwealth Railways L Class, originally built as part of an aid programme for Nationalist China but never delivered due to the communist takeover.

However, without doubt, the most revered is the streamlined C 38.

Regarded as the ultimate in steam express locomotive design and construction, the C 38 was a Pacific type (4-6-2) designed in 1938 by Mr Harold Young, Chief Mechanical Engineer of NSW Railways.

Inspired by locomotives appearing in the USA at the time, the design incorporated many mechanical

innovations and was unusual in that it featured a stream-lined boiler. From a purely aesthetic point of view, the smooth lines were not matched by diesel locomotives until perhaps forty years later. In the eyes of steam enthusiasts, they are a work of art never to be equalled. Five C 38's were ordered from Clyde Engineering for delivery in 1940, but the intervention of World War 2 meant that the first was not delivered until January 1943 - hauling its first revenue earning load on Australia Day, the 26th. These were difficult times; materials and skilled labour were in short supply, but the remaining four locos were delivered progressively before the end of the war in 1945. They were an immediate success. In fact, by the end of March 1943, after little more than a month in service, 3801 had run 12,300 miles; truly remarkable for a completely new class. Capable of speeds in excess of 80 miles per hour, the 38 was noted for its smooth-riding characteristics yet components were only balanced for rotational weight. Careful arrangement of the locomotive component mass eliminated the need for reciprocating counterweights and prevented hammer blows to the track. The frame consisted of a one-piece low carbon steel casting incorporating cylinders, steam chest, smoke box saddle, main air reservoir and brackets for much of the ancillary running equipment. The

steel was a grade easily welded to allow for easy repair should the need arise.

The total weight of the casting was 18.7 tons, an estimated saving of 3.6 tons over a fabricated plate or bar frame with suitable independent accessories.

This weight saving was important as it allowed the use of a larger, more efficient boiler without exceeding the permitted loads on driving and bogie wheels.

Experience with this type of frame on both the C 38 and the D 57 showed that maintenance costs were negligible when compared with a fabricated frame.

Other durability enhancing features were the use of self-aligning spherical bearings in the connecting rods and the axleboxes.

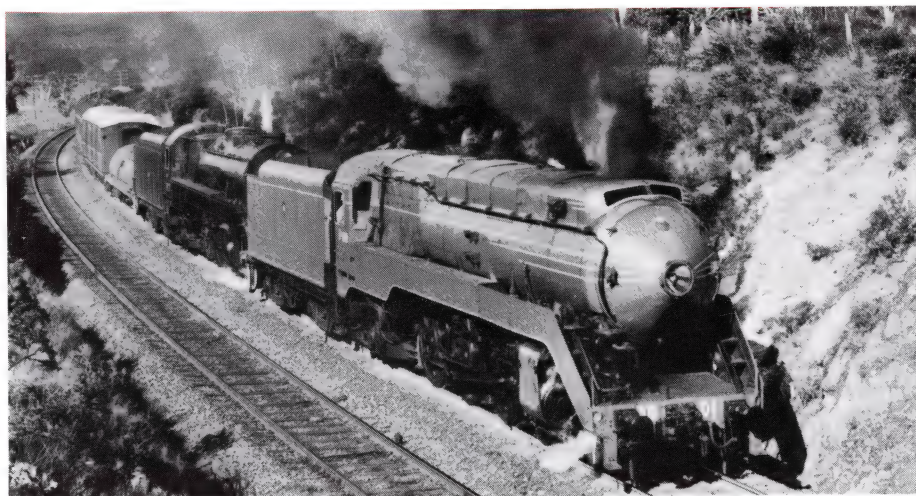
Until the design of the C 38, the



Officers from the armed services together with C during testing in 1943.



under construction ("Q" class is



The Clyde built 38 class express leads its non-streamlined sister engine on a Melbourne bound passenger train.

OF BRAWN AND BEAUTY

normal practice for connecting rod small ends was to provide pressed-in plain bearings.

The use of spherical bushes relieved torsional stresses on the crossheads and overcame problems with loose gudgeon pins, broken slide bar bolts and brackets and slide bar wear.

Hot bearing boxes on locomotives and tenders were an ongoing problem. In an attempt to extend the life of the axleboxes, self aligning spherical roller bearings were used for the first time.

These bearings provided for two degrees or 3-1/2 inch axial movement, permitted the axleboxes to move vertically between parallel guides and eliminated torsional loads on spring saddles, bearing springs and compensating gear. The use of special withdrawal sleeves on the inner bearings and

the easy removal of the outers allowed routine crack testing of the axles during maintenance.

The success of this outstanding locomotive design led to the construction of a further 25 examples.

However, attractive as the streamlined C 38 was, removal of the streamlining platework to perform some routine maintenance operations increased maintenance times significantly.

Consequently, aesthetics lost out to practicality and the additional 25 locomotives built in the Railways' own workshops between 1946 and 1949, were to a non-streamlined design.

The thirteen even numbers (3806 - 3830) were built at Everleigh, the twelve odd numbers (3807 - 3829) at Cardiff, and despite a rather different appearance they were mechanically similar to the streamliners.

The streamlined C 38's were delivered painted in wartime gull grey, but in the late forties all 38's were repainted or delivered in green with yellow striping.

However, in the early fifties, Departmental policy required that all engines be painted black as they passed through the maintenance shops.

Consequently, all but 3813 were repainted standard black, but after railway enthusiasts' representations during the sixties 3801 and 3830 were returned to their former splendour to be used by both the

Department and by enthusiast groups for special occasions in addition to their normal duties.

The 3801 class leader of this now famous locomotive class, was the pride of the NSW Railways for more than 25 years.

When first withdrawn from service it had covered 1,335,246 miles.

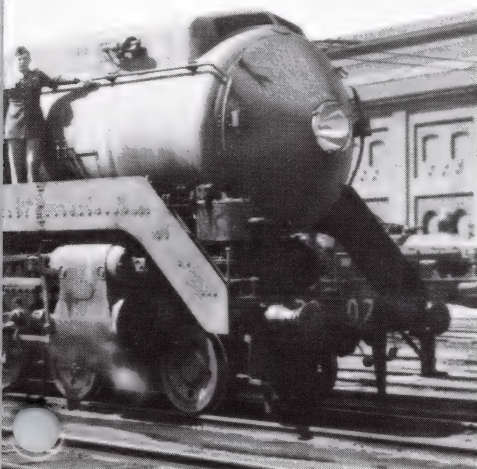
A change in Departmental policy saw the 38 class retained over the 36 and, after an overhaul, 3801 returned to service in August 1963. A breakdown caused its withdrawal again in 1965, but following a major overhaul, it was back in service in June 1966.

High points in 3801's service were 1964 when it set a record time of 2 hours 1-1/2 minutes for the Sydney to Newcastle run, a time that still stands, and its history making journey to Perth and back.

At the head of the 'Western Endeavour', 3801 became the first steam locomotive ever to travel east to west across Australia, a distance of 2,461 miles.

Sadly, it was then retired but, incredibly, during its active life, it had averaged in excess of 85,000 miles per year.

Happily, on 17th November, 1983, Chief Executive of the State Rail Authority, David Hill, announced that "this unique locomotive will be restored and again travel the track of NSW".



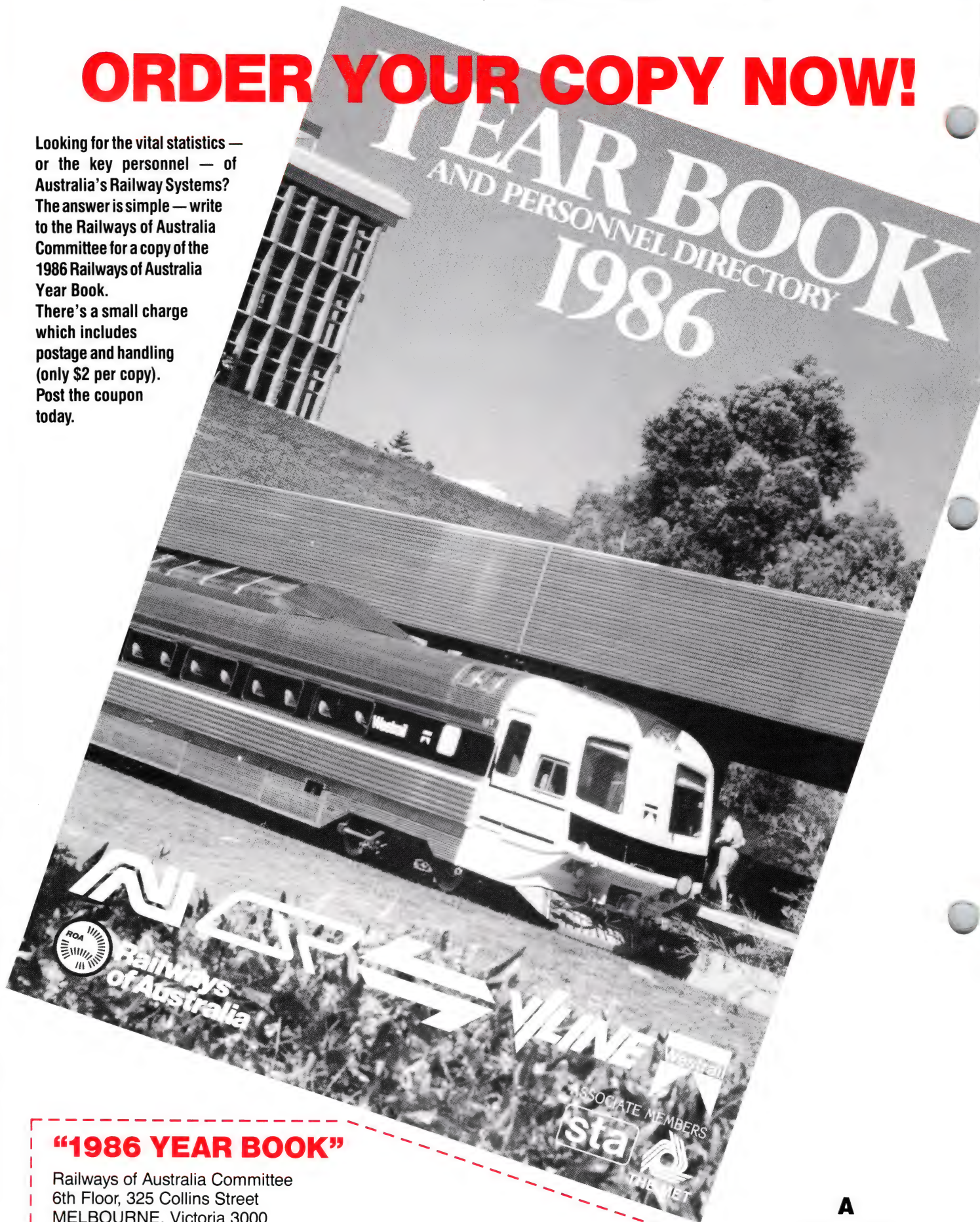
Engineers pose proudly with C3802



ORDER YOUR COPY NOW!

Looking for the vital statistics — or the key personnel — of Australia's Railway Systems? The answer is simple — write to the Railways of Australia Committee for a copy of the 1986 Railways of Australia Year Book.

There's a small charge which includes postage and handling (only \$2 per copy). Post the coupon today.



"1986 YEAR BOOK"

Railways of Australia Committee
6th Floor, 325 Collins Street
MELBOURNE, Victoria 3000

Please forward copies of the Railways of Australia Year Book for 1986.
I have enclosed \$2 per copy which includes postage and handling.

NAME

ADDRESS

.....POSTCODE.....

**A
WEALTH
OF
INFORMATION
AND
ONLY
\$2 PER
COPY!**

New life for a million Westrail baseplates

How do you convert existing track fastening components to provide a modern resilient system? That was the problem uppermost in the minds of Australia's Westrail Engineers, faced as they were by an accumulated stockpile containing in excess of one million rail baseplates. These were recovered from the upgrading of the Kwinana-Koolyanobbing railway where timber sleepers have been replaced by concrete sleepers. The Westrail situation was a unique opportunity and a considerable challenge and this has now been successfully met by Pandrol Australia Pty. Limited in conjunction with Westrail. This problem, which may also be faced by other railways under similar circumstances, now has a unique solution.

A method of reforming rail baseplates in an acceptable technical and economic way has been developed using a simple forging process. The standard double shouldered dogspike baseplate can now be modified and equipped with two 'Pandrol' Brand rail clip housings before returning it to service.

The modified plate design incorporates the two new clip housings diagonally opposite one another. These housings may be incorporated in the original plate shoulders or alternatively slightly away from the shoulders, as in the case of the Westrail design. In respect to the plate spike hold patterns, many configurations are encountered and these vary from railway to railway. The design of the modified plates has been developed to accommodate these hole variations and generally it is not necessary to punch any extra plate holes.

Pandrol Australia Pty. Limited has also developed a special range of plate 'Lockspikes' which can be used in the previous gauge spike holes. These new 'Lockspikes' do not impede the insertion or withdrawal of the rail and there is no need to disturb them once they are installed, which considerably increases the life of the timber sleeper and reduces "spike killing". The resulting assembly provides an "indirect" rail fastening system

whereby the rail is held in the baseplate by two 'Pandrol' rail clips and the baseplate is securely and independently fastened to the timber sleeper. For those not familiar with the 'Pandrol' system, the two 'Pandrol' clips provide the resilient component and they can be readily installed and removed quickly by means of a hammer, 'Panpuller' tool or 'Pandriver' machine.

In some instances the pre-plating of timber sleepers can substantially reduce site work and costs and this modified 'Pandrol' baseplate assembly can be used in this manner with the ensuing technical and cost benefits.

So far, design modifications have been evolved for the standard Australian 41/50 kg and 53/60 kg rail baseplates and several others.

In the early test plates the clip housings were formed leaving both ends open. To improve the design, strengthen the plate and achieve a smooth profile, this was later modified so that only one end of the housing remains open to receive the 'Pandrol' clip.

Some reduction in the plate bearing area results from the introduction of the clip housings.

However, any disadvantage from this is far outweighed by the accrued benefits to conversion to an indirect resilient fastening system and by substantially reducing sleeper/plate interaction with causes damage to the sleeper under traffic.

During the development period, Pandrol laboratories successfully tested the assembly and proved the technical integrity of the system. As a parallel test Westrail installed assemblies provided by Pandrol Australia Pty. Limited in an operational track adjacent to a mechanical joint. By doing so service confidence was established in the concept leading in due course to full-scale trials and ultimately to the acceptance in larger installations. The original in-track test has now successfully carried in excess of 32 M.G.T. As an ongoing programme Pandrol has carried out further rigorous laboratory testing to provide additional technical data to meet customer requirements.

The baseplates may require inspection before being processed

in order to establish the quality and suitability. Any tolerance variations in plate widths have to be assessed so that this can be accommodated in the die design and ensure that all the technical requirements are met. The plates are heated prior to pressing. This ensures that the plate material is normalised and any pre-conditioning effects from earlier service, such as work-hardening, are minimised or eradicated.

In the case of the Westrail baseplates the surplus stockpile was located adjacent to the Midland Railway workshops, so that by utilising their own manpower and facilities close at hand, Westrail substantially cut down handling and manufacturing costs.

Some 100,000 baseplates for rail with a 128mm foot width (i.e. 41,47 and 50 kg/M rails) are planned or already installed by Westrail in 1983/84. These will be located in the Mundijong-Jarrahdale bauxite line, the Koolyanobbing-Kalgoorlie transcontinental railway and the South West lines between Pinjarra and Bunbury. Axle loads of up to 25 tonnes are experienced on alignments incorporating minimum curvature radius of 200m and gradients up to 2.5% (1 in 40). Trains are operated at speeds up to 90 kph with consistent weights of up to 4800 tonnes.

This significant breakthrough in recycling a most important costly item of track componentry has also caught the imagination and interest of a number of railways. To support this Pandrol Australia Pty. Limited has provided its own baseplate pressing facilities at its new Blacktown factory in New South Wales.

The co-operation between Westrail and Pandrol Australia Pty. Limited in the first instance has shown that where logistical restraints exist and economics dictate, a workable satisfactory and cost-effective solution can be mutually achieved. Other Railways in Australia have now acknowledged this development. Further installations have been made and will be reported on in a later issue of Track Report.



Thousands were treated to a unique and historic experience recently when Ipswich Railway Workshops opened their famous entrance gates to celebrate one hundred years of Railway engineering.

A special steam train hauled by BB18¼ class engine 1079 conveyed school children and members of the public to the Workshops.

The train consisted of vintage wooden coaches and was patronised to capacity.

At the opening, Queensland Railways former Commissioner Mr. Mendoza spoke of the important role played by the Workshops both as the System's major engineering complex and as a vital component of the economy of Ipswich.

"I am pleased to be back here for this celebration and still regard myself as an 'old boy' of Ipswich Workshops" he said.

The Ipswich Workshops had its foundation in the assembly of rolling-stock brought out from England for the first rail line in the State, from Ipswich to Grandchester. This rollingstock arrived during the latter part of 1864.

Five original buildings still stand, and are now the Trimmers, two Timber Mills, Wheel and Spring Shops.

Carriage and Wagon construction and maintenance were carried out in these shops.

It was intended that sufficient accommodation to house all the Workshops activities would be built, but a change in the Government resulted in a direction that no further buildings were to be erected.

In the latter part of the 1890's, the position in the old Workshops had become intolerable and about the turn of the century, construction of the remaining buildings was commenced.

Over the years, the areas of shops increased as demands on them grew, until today there are 6.5 hectares under cover, whilst the enclosed area of the yard and buildings is about 22.5 hectares. From 1877, until construction of



steam locomotives ceased in 1952, 218 locomotives had been built in the Ipswich Workshops. Several thousand wagons, many carriages and rail cars have also been built there.

Ipswich Workshops had built a strong reputation upon the ability and skills of its tradespersons. In February, 1920 the Workshops made a unique contribution to early

Australian Aviation history. On December 10, 1919, famous aviators Ross and Keith Smith and two other crewmen completed the first air journey by an Australian Crew from England to Australia when they landed in Darwin. In their efforts to continue to the southern states, their aircraft developed engine failure at Charleville.

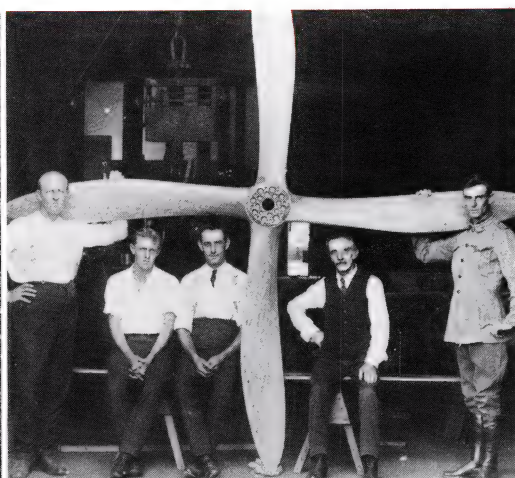
100 YEARS OF RAILWAY



The Australian Government made representations to the Queensland Government, who then offered the facilities of the Ipswich Rail Workshops for the necessary repairs to be made.

After much exacting work, a new propeller was manufactured from planks of Queensland maple, glued, then clamped.

Using profiles from the original



Pictures anti-clockwise — Propeller manufactured in Pattern Shop, Ipswich Railway Workshops early in 1920, for Vickers Vimy plane used by Sir Ross and Sir Keith Smith, on the first flight from England to Australia, 1919. Left to right: G. Page, C. Boyd, F. Hazlewood (Patternmakers); J. Millar (Pattern Foreman); Sgt. Jim Bennett (Flight Crew). School children arriving by steam train for visit to the Workshops.

Workshop employees being addressed by former Queensland Railways Commissioner Doug Mendoza.

Main access road to the Ipswich Workshops.

'A vital part in the history and development of Ipswich'

blades, the exact shape and curvature were duplicated. New connecting rods for the engine were forged and carefully machined. The damaged crank-case was also repaired.

The assembled engine was tested successfully and the aviators completed their journey.

Ipswich Railway Workshops produced a large quantity of munitions of war.

In World War I, gauges for the manufacture of ammunition were manufactured. During the second World War a remarkable variety of essential work was carried out. Work performed included the preliminary turning of 25 pounder gun barrels, patterns, castings, forging for 3,000 HP marine engines, crankshafts for aeroplane engines and a number of large lathes. One of these lathes was the largest machine tool built in Australia to that time.

The Tool and Gauge Shop at the Workshops was built primarily to provide high precision instruments for ammunition work and also to provide for tool production for general engineering work.

Present Situation:

Work in these workshops is now largely concerned with maintenance of existing carriages, rail motors and wagons and the manufacture of component parts for use in other Workshops throughout the State. At the present time, about 1,660 people are employed in the Ipswich Workshops. The highest number of employees just after World War II, was about 3,300.

Ipswich Railway Workshops has played a vital part in the history and development of Ipswich.

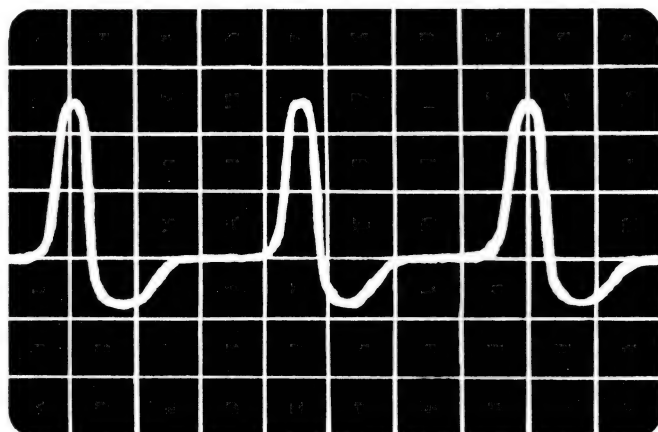
Since 1875, it has offered employment to many generations of thousands of Ipswich families. In return, these employees have given the Workshops its history and the proud engineering reputation it holds today.

The present Chief Mechanical Engineer in Charge of the Workshops is Mr. John Jeffcoat who has held this position since 1974.



ENGINEERING AT IPSWICH

for the heart of your
signalling equipment...



... the good choice is the
high voltage impulse
track circuit

a product



Division Appareillage Traction Signalisation

194, avenue du President-Wilson
93212 LA PLAINE SAINT-DENIS - BP 51 FRANCE
Tel. : 33 (1) 820-63-73. Telex : 620837 Mecalec PLDNI

— PRODUCTS :

- Electromechanical safety relays
- Safety solid state relays
- High voltage impulse track circuits with or without insulating joints
- Electric point machines
- Points detector
- Electronic teletransmission

— SYSTEMS :

- All relay interlocking cabins (with or without geographical circuits)
- Luminous automatic block system
- Automatic block system with restricted permissivity
- Centralized control of traffic
- Centralized control of sub stations
- Computerized system of train describer
- Automatic train routing
- On-board cab signal system
- Continuous speed control
- Automatic train control

AVAILABLE FROM

KENELEC (AUST.) PTY LTD
48 Henderson Road, Clayton, Vic. 3168
Tel. (03) 560 1011; Telex 35703

A BIBLIOGRAPHY OF AUSTRALIAN RAILWAY AND TRAMWAY LITERATURE

compiled by
Howard Quinlan. 145 x 210mm, 128pp,
soft covers. Available from the ACT
Branch, Australian Railway Historical
Society PO Box 112, Civic Square,
ACT 2608 at \$7.45 postage paid)\$0.90
extra for certified mail) or \$5.95 over
the counter.

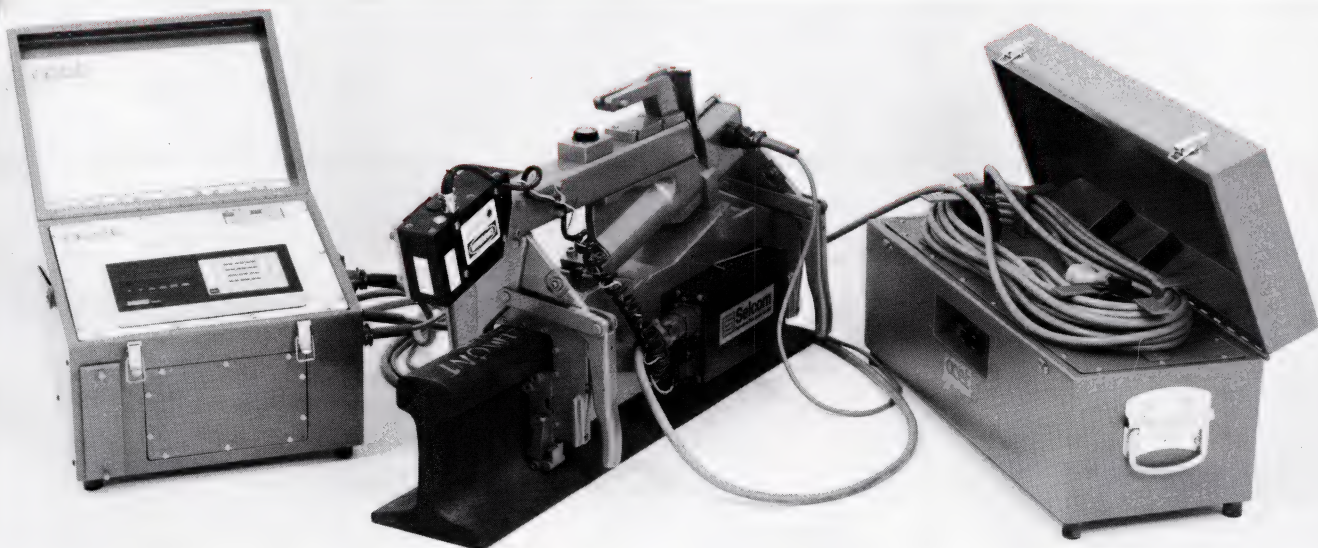
Most readers will be familiar with
ATLIS - the Australian Transport
Literature Information Service
produced by the Bureau of
Transport Economics from 1981, and
covering ALL transport subjects.
This ARHS bibliography picks up
770 monographs from railway and
tramway-related entries of ATLIS,
plus additional material from the
ARHS itself, its members, and the
Australian National Bibliography.
The primary sort is by title. While no
bibliography is complete, this one is
as complete as any, with the
exception of articles within journals,
Parliamentary material, pre-1946
material, non-railway publications
with only some rail content, and
international publications with only
short treatment of Australia.
There are no abstracts, but
identifiers for library search,
publication details and (where
relevant) ATLIS numbers are given.
There is an index by author/subject
which will enable the user to pick
up most monograph material of
consequence on a specific railway
subject.

This valuable bibliography is a snap
at the price, and should prove
invaluable to everybody who needs
a quick reference to railway
monographs.

It deserves a place on every
researchers bookshelf, and in every
public library with pretensions to a
railway collection or reference
service.

However, a problem with all
monographs is that none can be
indexed until the book is written.
Thus we find no direct reference to
subjects such as containers, CTC, or
XPT as such - which have not yet
been the subject of a monograph.
These subjects are of course in the
ATLIS which picks up particular
articles.

If the ARHS could match this
excellent bibliography with future
issue of a selected range of
periodical articles - a much larger
and harder exercise - the Society
would have produced a near-perfect
combination of bibliographies for
every railway bookshelf.



Laser look at rail head profile

Although rail is a major item of expense for all Railways, very little systematic, quantitative analysis governing its behaviour has been available to make sound rail management decisions.

Fundamentally, the reason is that the industry has lacked a practical data gathering means which was quick, easy to use and accurate enough to be relied on by both field people and more office bound types who needed data that was portable, accurate and presented in a way that could be absorbed and acted upon easily.

Obviously scope existed for a number of approaches ranging from sophisticated vehicle mounted systems to portable hand operated systems capable of combining acceptable speed and accuracy appropriate to a wide range of circumstances.

One such example of the portable type in use both at Mt. Newman Mining and Westrail is based on the properties of a laser.

The use of lasers to make very accurate measurements of distance was well established in other fields. It followed then that, if a laser could be moved around a rail head following a known geometrical path, the shape of the rail head could be described with great accuracy.

This was the approach taken by ACET Limited of Perth in developing a rail head gauge in collaboration with Mt. Newman and Westrail.

The objective of portability constrained the size of the device

particularly since the range of movement of the laser around the rail head had to encompass planes which could act as references for location and orientation of the image measured.

In principle the gallium arsenide laser creates an illuminated spot on the surface to be measured. The receiver sees the reflected scattered light and measures its point of origin and the distance to the reflecting surface.

Any variation in the measured surface's position will result in a change in the location of the focused spot's image on the detector.

Apart from the measured distance to the rail head at any point, the location of that point relative to a datum is required.

This is established by measuring the amount of rotation of the detector by means of a rotary potentiometer on the axis of rotation.

With this combination of angle and distance, the geometry of the rail head is described and located accurately, provided that the device is clamped firmly to the rail section. Clamping is accomplished by a combination of springs and rollers at two contact points some 500 mm apart forced into place by two overcentre levers.

In practice the measurement sequence is started from one extreme position of the rotating head.

As the head is rotated slowly from this point to the other extreme and

back again (in about 10 seconds), a total of 500 combinations of distance and radial position are read and recorded.

For the comparison of the measured profile with the stored profile of a new rail, the operator can nominate one of two possible fits: the first only on the sloping planes on the underside of the head; the second on both these two planes and the lower parts of the vertical side faces. The latter fit is preferable for accuracy provided that the lower vertical planes are undamaged.

At start-up, the system goes through a self check routine and advises the operator when this is complete. Following this, a two minute calibration routine is necessary, using a specially machined disk, to ensure accuracy of measurements.

Through a key pad the operator may then enter information which is relevant to the measurements to be made, such as rail type, location, track characteristics etc. These are stored with each reading.

For most purposes, convenient output of data from the bubble memory is a combination of tabular and plotted information, showing the comparison of measured and unworn rail heads in actual size together with computed head loss and, of course, the information recorded by the operator. Output can be varied to suit user requirements.





Recording track at 120km/h

The \$1.25 million self-propelled RVX4 track evaluation car, commissioned recently by the SRA is the latest in railways technology.

It measures and records seven aspects of track geometry, landmark locations, vehicle speed and five parameters associated with overhead wiring.

This information is fed into a computer and analysed to produce reports on track quality and track irregularities, which are printed concurrently by a unit installed in the vehicle.

These reports enable track maintenance staff to locate track irregularities, determine their cause and deal with them.

They also provide management with an overview of track conditions.

The car has a video camera on the roof to record the movement of the pantograph and overhead wire.

The camera image is directed to a monitor in the car and recorded on videotape.

The equipment is capable of identifying irregularities in track and overhead wiring when travelling at speeds of up to 120 km/h.



Trains that passed...Stan Dick

Stanley Edward Dick 1922-1985

[Editors Note:

Mr S.E. Dick, one of Australia's lesser-known but greatest diesel traction engineers died in early December after a long illness, at age 63.

And while **Network** rarely prints obituaries, this is one railway Australian's story that is worth telling to those who follow.]

Born in 1922, Stan Dick joined the former St Mary's, NSW firm of A.E. Goodwin as an apprentice toolmaker in 1938.

Caught there by wartime manpower regulations, he nevertheless served in the Home Defence Forces and at 22 was the youngest foreman in Goodwin's history.

In 1948 at age 26, he joined the (former) Commonwealth Engineering Company as a Design Draftsman and for the next 32 years until his retirement in 1980, he remained at Comeng.

He was instrumental in and increasingly responsible for the engineering of many Australian diesel railcars, starting with the 4-car Tasman Limited and ending with the power car of the XPT.

His original design ideas were widely copied, across Australia and internationally.

The products of Stan Dick's fertile brain, busy pencil and slide rule covered the complete spectrum of the last 40 years' diesel railcar development in this country: the original Tasman Limited and the QR 1800 class (Drewry power bogies); the former Commonwealth Railways' NDH; the QR 1900 class (the first stainless steel coaches built in the British Commonwealth); the broad gauge cars for India and the metre gauge ones for Asia; the unique NSW Budd RDC stock; Westrail's first stainless steel suburban railcars and its famous **Prospector**; the South Australian STA Jumbo cars; and finally, XPT.

He was an impeccable selector of proprietary equipment and our leading exponent in its application to the vehicle.

But Stan Dick's achievements went much further than diesel railcars.

He pioneered the use of simpler control equipment, lucid wiring diagrams and electrical layouts generally; the application of standard Westinghouse train air brakes to the electro-pneumatic railcar air brake system; the use of 3-dimensional models to check accessibility; the introduction of disc brakes (NSW) and air-suspension bogies (WA); reliable low-cost hydraulic radiator fan drives using Australian-made industrial hydraulic equipment; and single-handed power brake controllers.

He designed his own control systems at a fraction of the cost of overseas manufacturer's packages; re-engineered the old NSW's 442 class Alcos into State Rail's highly-regarded and more numerous 80 class; completely re-designed the cooling system of the Pilbara M636 iron ore locomotive; and before retirement stripped the English HST power car to its bare essentials, and redesigned it into the most reliable diesel vehicle in NSW today. He was a leading exponent of modern lightweight all-welded passenger car bogie construction when most engineers were locked by precedent onto steel castings. These achievements are on the rails, for us to see running. Stan Dick's unknown achievements lay in preventing other people's design disasters that did **not** happen. On countless occasions he pointed out, in the layout stage, things that would **not** work.

He suggested that by doing this or that instead, the train would work a little better, be simpler or cheaper, or easier to maintain.

On many occasions it was Stan Dick's brain that led to Comeng's winning orders with better mousetraps at the concept stage. It can also be revealed, now that he has gone and Tulloch's have gone too, that at the personal request of a NSW engineer Stan Dick visited Tulloch's unofficially, pointed out several major structural weaknesses in the former 1200 class NSW railcars' body shell.

The Comeng management never knew this, of course - but Stan

Dick's sense of responsibility extended beyond the works gate, to the railways as a whole.

Many people have said that Stan Dick was born a gifted engineer. Not so - engineers are developed, and not born with magic technical genes.

This Australian was certainly born with an enquiring mind, but he developed himself from an apprentice toolmaker into a respected engineer by a sound factory training base, careful study, and above all the application of common sense.

In this he was aided by the salutary experience, as the commissioning engineer, of having to get the Comeng trains he made work, out on line at 03.00 - an aspect of developing the engineer that is often forgotten in today's responsibility charts and compartmented organisations.

Stan Dick preached this gospel continually; not all would listen. Stan Dick did not tolerate fools, be they working above, below or beside him.

And in 32 years of engineering he surely encountered many. But he always gave them the benefit of the doubt and the opportunity to prove themselves otherwise.

He was a listener, and would say so when he was wrong (which was not often). Such was his professional stature that even the most ruthless, authoritarian and abrasive executives in his company rarely overruled Stan Dick on a key technical issue; when they did it cost them (and their client) large sums of money. When there were 14 engineers on the old NSW Company's staff at the onset of an industry recession in 1961, the then Directors chose to "de-skill" the firm and economise by sacking 12 engineers.

They forgot about the 13th who was overseas, but they surely remembered to keep Stan Dick on the payroll; he was an irreplaceable asset to the firm and would have been a deadly weapon in the hands of the competition.

(continued on page 56)



Stan Dick stands before the XPT, the last power plant he worked on before his retirement in 1980.

(continued from page 55)

He was very loyal to his firm despite several attractive offers during his career, and became a core around which the "re-skilling" process later took place under more enlightened managers.

Being a company man rather than a Railways officer, and a modest man in a rather reticent industry, Stan Dick was not well-known outside the immediate mechanical engineering circles in which he worked; the only known public mention of his name in the literature is in the reprint of Leon Oberg's book "Locomotives of Australia".

Within these circles, however, Stan Dick was universally respected - and, respected the most by the people he trained.

For there are many men in the 30-55 age group in rolling stock today to whom Stan was not only teacher, professional guru and father-confessor, but the man who had saved their jobs when they were about to blunder, and had the wit to listen to wiser counsel. Not all were Comeng men.

Stan Dick never made much money from his brains; that benefit was confined to the stockholders. But he had a lot of fun, and a keenly-developed sense of humour. His description of the enthusiasm of his superior for a new liquid-rubber gloop that, somehow, was expected to creep upwards over the frames and sheeting of a plywood ceiling directly exposed to tropical downpours was a classic (he designed a stainless steel roof and fixed the works to have it ready when it was inevitably called for). Aided and abetted by his colleague, Ron Gray, Stan Dick carefully avoided advising the old NSW Rail that the Budd RDC's would have standard American interior colours (a light, bright scheme) instead of the then standard dun-brown and dark green.

The message got through; NSW Rail used their green seats elsewhere and quickly fitted tasteful grey ones in the RDC where the interior won wide public acclaim for the railway. In his personal dealings, Stan Dick stuck to his professional guns and kow-towed to no man. He never

failed to give straight unbiased advice to his company and clients - even when it would cost money, and was unwelcome.

He would never sign a drawing or document that he did not believe in. This irritated many people; invariably they were lesser men, who passed unnoticed and left little residual impact on our industry.

There is a lesson for all of us here. Stan Dick was a hard worker and a stayer, but by his mid-fifties his health was not good. In 1980, with XPT on the rails he retired from the industry to Forster on the NSW North Coast.

When Stan Dick died on December 2, the Australian rolling stock industry lost one of its most distinguished sons. His legacy to our railways is three fold: the trains that he built, the people that he trained, and the standards that he set.

Mr Dick is survived by his wife, two daughters and two sons - both sons carry on the family tradition as mechanical engineers in State Rail.

Ian Macfarlane



Name a travel agency that cares as much about your booking to Ballarat as your beachcombing in the Bahamas.



When you want to go overseas, most people are only too willing to help. On the other hand, when you're planning a holiday in the same country or, heaven forbid, the same state, there doesn't seem to be the same amount of interest.

At V/Line Travel, we see things a little differently. We believe a short trip is every bit as important to you as a long one.

It's probably got a lot to do with our rail experience, where for years we've always taken care of both. And now that we've extended our expertise to all kinds of travel we'll continue to think that way.

Whether it's to Ballarat or the Bahamas, we'll pull out the stops to ensure all your travel arrangements, your accommodation and, should you need it, accompanied tour, are as close to perfect as we can make them.

To that end we have connections worldwide and a staff as experienced in the ways of the Orient Express as they are in the local V/Line passenger services.

Call in and talk to

us on the ground floor of Transport House, 589 Collins Street, Melbourne.

Or phone (03) 6191500.

V/LINE TRAVEL
Going places!

Somewhere along the line you'll be looking for a reliable Weatherproof Telephone.

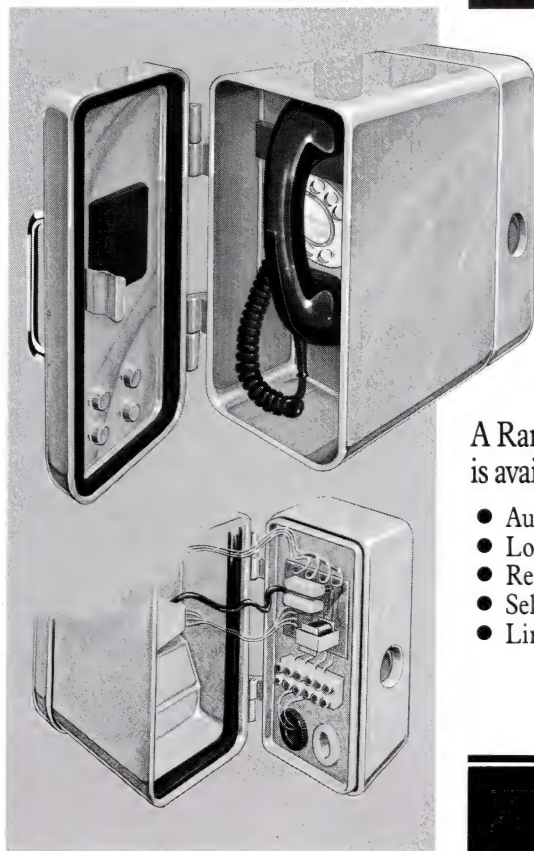
**When you do,
look to Ansa.**

The Ansa Weatherproof Telephone has been specifically designed with Australia's rugged and testing weather in mind.

Our unit has a proven track record for reliability and performance in a variety of installations like Railway Communication, Freeways, Remote Locations and Non-Secure Sites.

Queensland Railways and The State Rail Authority of New South Wales currently use the Ansa Weatherproof Telephone extensively throughout their networks.

The Ansa Weatherproof Telephone is your guarantee of reliable, high quality communications under the most trying environmental conditions.



Consider these Characteristics

- Easy Installation
- Compact • Secure
- High Quality Speech
- Telecom Permit No: C84/31/55
- Insulation tested to 3000 Volts
- Robust Construction & Design
- 3 Section Case for Ease of Maintenance
- Australian Made for Australian Conditions

A Range of Options is available including

- Automatic, Magneto or C.B. Models
- Lockable Case
- Recall Push Button
- Self Identification Module
- Line Lockout Module

Ansa can fill all your Communication needs

- Design, Manufacture & Installation of Railway Communication Systems
- Computer Systems & Products
- PABX Installations
- Intercom Systems • Radio Paging
- Maintenance & Repair Services
- Business & Domestic Telephones

The Ansa Weatherproof Telephone

For further information and technical assistance write or call now.

Ansa

Ansa Pty Ltd,
21 Hudson Road, Albion 4010.
Telephone (07) 262 6222.

ANS 253

STORE-86

NORTH AMERICA

Twenty-three individuals, including four spouses, assembled at Broadmeadow Station, N.S.W. to attend STORE '85 organised by the Institution of Engineers, Australia, National Committee on Railway Engineering.

This proved to be a happy group, and at the time of parting at the end of the tour all were considerably wiser with respect to the railway industry in the Hunter Valley and, indeed, the industry generally.

The whole group firstly toured the Comsteel wheel forge and machining plant and axle manufacturing and assembly facility. In the afternoon the railway engineers toured the Goninan works where Sydney suburban railcars were in production.

The engineers spent Saturday morning on a fascinating visit to the Tomago aluminium smelter, followed by an inspection of train loading facilities operated by Mt Thorley Coal Loading Ltd.

Sunday morning saw an early start for a tour by the whole group of the Port Waratah Ship Loader, where the coal trains are unloaded for export, followed by a bus tour of Kooragang Island, where a new coal loader has recently been installed, and the Industrial Highway.

STORE '85 was completed by an abbreviated inspection of Richmond Old Main Colliery near Kurri Kurri.

This is one of the earliest collieries established in the Hunter Valley and has great historical significance.

Unfortunately, the schedule precluded a complete inspection, and after a quick lunch at Kurri Kurri, the group returned to Broadmeadow to enable them to join the 3.30 p.m. XPT for Sydney.

This short STORE tour, hurriedly arranged following the unfortunate cancellation of the proposed visit to America, was an excellent substitute and thoroughly enjoyed by all who participated.

STORE '86 - United States and Canada

The National Committee on Railway Engineering of the Institution of Engineers, Australia, is proceeding with the organisation of its 1986 Study Tour on Railway Engineering (STORE).

The program is one of 18 days duration between the 7th and 25th October 1986 and includes attendance at the Heavy Haul Railway Conference in Vancouver between 13th and 17th October.

The tour commences in San Francisco with inspections of Muni, the Urban light rail network, BARTD, a modern regional rapid transit system 130 km long and Cal Train.

Next stop is that great waterside city of Seattle with tours to the new Containerport and the Boeing aircraft factory. A coach drive will then take the group into Canada where free time will be available to visit Vancouver's massive Expo 86 which incorporates a Transportation Theme at which those secret steam "buffs" will be hoping to see the former C.P.R. Royal Hudson 464 unit running.

A feature of Vancouver is the new 22 km long Regional Rapid Transit System, North America's newest light rail system, featuring the SELTRAC train control system using over 1,000 microprocessors and computers for regulation of the speed of each train.

Seven days will be occupied by the events related to the Heavy Haul Railway Conference, registration at which is included in STORE '86 cost.

The conference, which lasts 5 days, is a significant occasion for the exchange and dissemination of the latest advances in heavy haul rail operation throughout the world and is a meeting place for railwaymen, suppliers and clients on a universal scale.

Appended to the conference are two tours to BC Rail, a new heavy haul coal railway which features electric Gleneyre L.I.C. signalling, and the Canadian Pacific Rodgers Pass project, providing a new deviation and tunnel for westbound grain and coal trains.

Further information may be obtained from: The Conference Manager, STORE '86, The Institution of Engineers, Australia, 11 National Circuit, Barton ACT 2600. Phone: (062) 73 3633

Not just a pretty face

Chopper system updates State Rail Suburban Cars

These great looking cars offer more than just their good looks. They're the first of a new breed to enter the Sydney System and utilize the most modern chopper control system available.

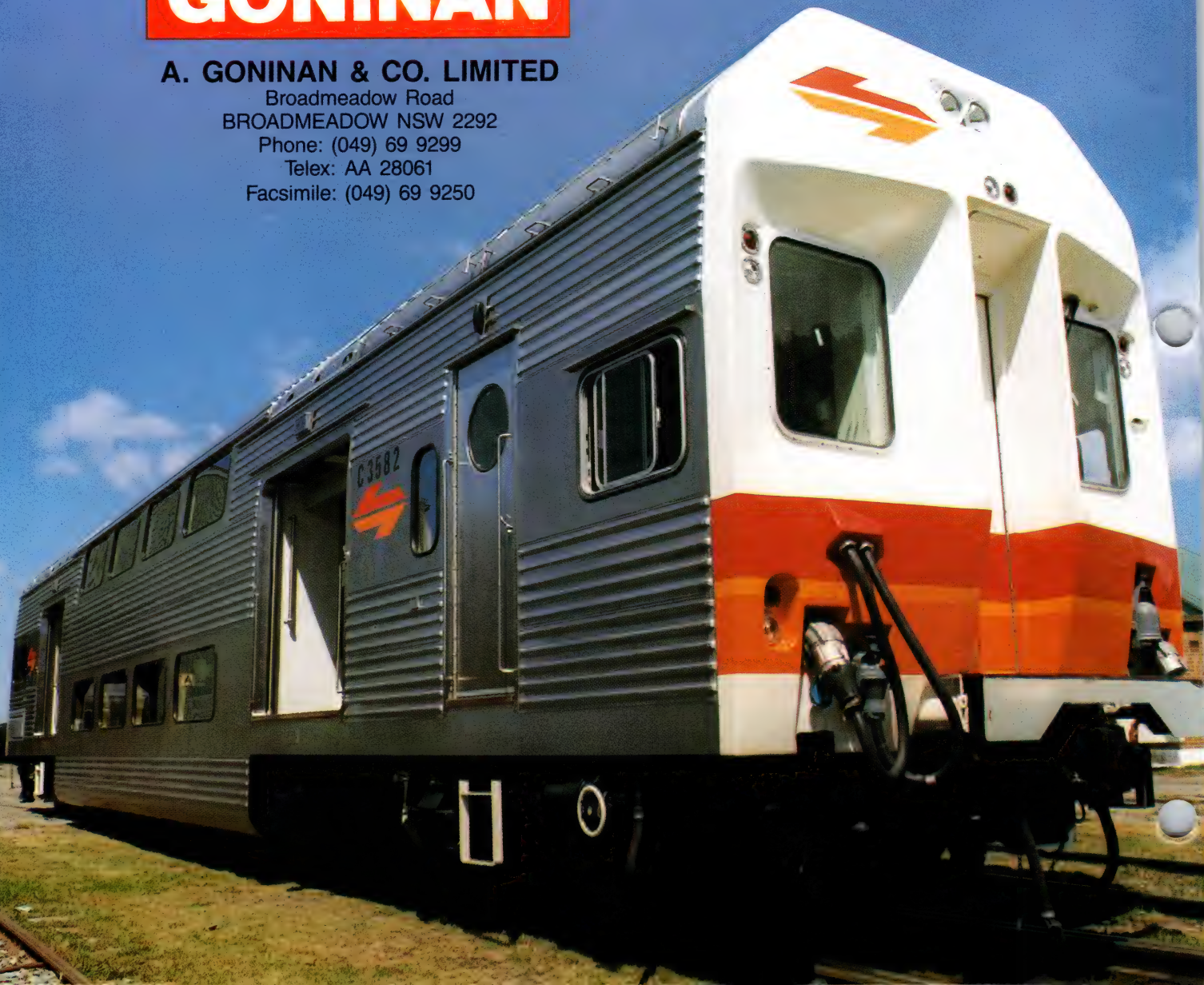
This system incorporates Four Quadrant GTO Thyristors to offer Sydney commuters smoother acceleration and deceleration and State Rail greater efficiency.

Passengers will travel in greater air-conditioned comfort in the all new interiors which follow world styling trends.

GONINAN

A. GONINAN & CO. LIMITED

Broadmeadow Road
BROADMEADOW NSW 2292
Phone: (049) 69 9299
Telex: AA 28061
Facsimile: (049) 69 9250





This railcar is a shining example of Australian innovation.

20 years ago Australia was a nation on the move.

With our population growing and our cities expanding, the need for radical improvement of our rail transport systems became a national priority.

The design engineers and planners who addressed that problem then with such foresight, provided us with the foundations of the sophisticated rail systems we depend on today.

Not the least of their innovations was the design and development, in 1968, of the stainless steel double-decker passenger car – a dramatic improvement to the then existing international design.

The Australian experience has proved stainless steel to be an

ideal material for carriage construction. So much so that the Japanese are now using it to build a large fleet of railcars. The inherent strength and durability of stainless steel, combined with its uniquely attractive appearance, provide both the functional performance and the modern image expected by today's design engineers and the travelling public.

So next time you board one of those gleaming stainless steel railcars, you'll see why the future for Australia's rail systems is looking so bright.

Coated Products
Division-Stainless



BHP
Steel

Five Islands Road, Unanderra
NSW 2526 Australia.
Phone (042) 716544. Telex AA29004.
Sydney (02) 7088822. Melbourne
(03) 2687722. Brisbane (07) 3450588.
Adelaide (08) 2437373. Perth
(09) 3300696. Distributors in all
states and New Zealand.

International traffic trends

The UIC's quarterly analysis of trends in intra-European freight and passenger traffic by rail show some encouraging signs of growth for the first half of 1985 compared with the equivalent period of 1984.

The growth in passenger traffic (measured in passenger-km) has been very mixed, but generally in the range of 1% to 5% in Western Europe:

1%: Sweden, Belgium, Norway.

2-3%: Luxembourg, Denmark, Italy, Spain, Portugal. **4-5%:** Federal Republic of Germany, France.

The countries with the biggest growth rates were Ireland (21%) and Switzerland (9%). In Britain, Netherlands, Finland and certain Eastern European countries the traffic level declined marginally.

As far as freight transport is concerned, growth in tonne-kilometres

has been stronger with increases in the 2% to 8% range:

2-4%: Switzerland, Sweden, Austria, Denmark, **5-7%:** Netherlands, Belgium. **8%:** Federal Republic of Germany, Luxembourg, Portugal.

In Norway an increase of 13% was recorded. However in Italy, Ireland, Greece, France, Finland and Spain the traffic dropped.

One significant element of the freight handled was the faster growth of international traffic in all the countries concerned except Spain and France.

In the Netherlands, Federal Republic of Germany, Norway and Luxembourg, growth rates were in excess of 10%, whilst in Greece, Denmark and Belgium they were over 5% in international freight. In Turkey a jump of 58% was recorded.

This international door-to-door service will vary somewhat from country to country.

Large numbers of stations will be involved on some railways (BR, DB and SNCF) while only three stations will handle this traffic in Luxembourg and the Netherlands.

BR, DB and SERNAM will be able to operate a home delivery service while other railways such as CFF and OBB will subcontract this work to outside firms with the SNCB using taxis for this purpose.

Record run for ICE Trainset

The German Federal Railway's Intercity Experimental (I.C.E.) high speed train reached 317 km/h on conventional track between Bielefeld and Hamm on the Rheda-Wiedenbruck-Oelde line late last year, which beats the previous record for a three-phase current tractive unit and constitutes a new rail speed record for German Railways.

Tests on the I.C.E., which is designed for working at up to 350 km/h are to continue this year on the new Hannover-Wurzburg line.

Current trials are also providing an opportunity to test various technical innovations aboard an actual train for the first time, the ultimate objective being to develop a new generation of high speed trains, the "Intercity Express" (also called ICE) to be worked at revenue speeds of 250 km/h as from the early 90's when the new Hannover-Wurzburg and Mannheim-Stuttgart lines are opened.

Over and above the commercial advantages of higher speeds, this new passenger stock will feature numerous improvements to passenger comfort and to quality of service: video films, music, integrated information systems at every seat with display of reservations data, details about the next scheduled station stop, journey times, on-train services and other DB products, etc.

Two seats in 1st class will be equipped with telephones and VDU screens.

Goninan takes over G.E. spares

A. Goninan & Co Ltd, of Newcastle, has taken over the distribution in Australia of spare parts for General Electric locomotives and rail motive power systems.

Goninan has been a major Australian manufacturer of locomotives, using General Electric technology since 1959, but under its license agreement did not provide spares.

Now Goninan has taken over the spares distribution from Australian General Electric Ltd, a wholly-owned subsidiary of the U.S.-based General Electric company.

Customers include the NSW State Rail Authority, Queensland Railways, Australian National Railways, Mt. Newman, BHP, Australian Iron & Steel, and John Lysaght.

The spares business office has been relocated to Cooper St, Smithfield, in western Sydney.

(Telephone (02) 609 4319.

Facsimile (02) 609 5942.

Telex 177486 Gonin).

Nippon know-how fancies MotoRail

The Japanese National Railway is recognised as one of the most advanced Systems in the world - Japan certainly runs some of the worlds fastest trains.

It is interesting to note MotoRail has only recently been introduced on a trial basis in Japan.

The 1100 km route between Tokyo and Kitakyushu was selected for the trial program.

Eurail Express

Eight European Railways — BR, CFF, CFL, DB, NS, OBB, SNCB and SNCF through SERNAM (its parcels subsidiary) — have decided to market a new international part-load product as from January 1986.

Known as "Eurail Express," this service will be based on through door-to-door tariffs including the cost of customs clearance on arrival, with the destination railway automatically taking charge of customs clearance.

Meeting delivery schedules will be an essential feature of the service and railways will have to pay compensation for late delivery attributable to them.

The technology you need from OKI. The backup you demand from Plessey.

OKI microwave radio communications systems are proven worldwide, including Australia.

And in this market, OKI equipment boasts another plus — back-up from Plessey Australia Pty. Limited.

The result is a unique partnership; OKI digital microwave equipment and complete turnkey services supported by the Australia-wide installation and service network of Plessey.

OKI offers the features you'll need to specify. Including compact solid state design, high bandwidth efficiency, minimised interference, high reliability, easy maintenance, and conformity to both CCIR and CCITT recommendations.

Within Australia, Plessey undertakes a broad range of activities from equipment design and manufacture, through systems engineering to complete turnkey communication projects for government, industry and commerce.

Our microwave turnkey services include project management, system design and engineering, technical training of personnel, the installation and commissioning of equipment and logistic support.

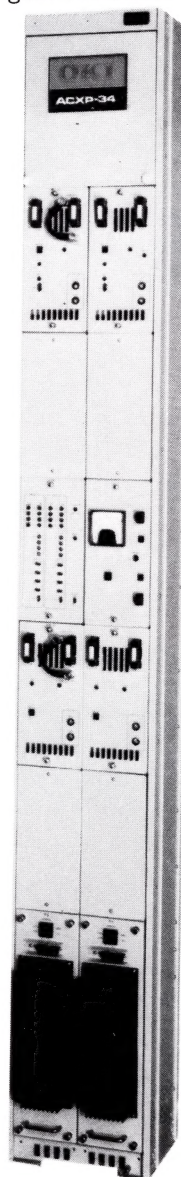
For more information about OKI digital microwave radio communications equipment and Plessey turnkey services, please contact the Product Manager, Microwave Systems, Telecommunications Division, Plessey

Australia Pty Limited, Railway Rd, Meadowbank, N.S.W. 2114; Telephone (02) 807 0400; Telex AA 72384.

In Japan, OKI Electric Industry Company Limited, 10/3 Shibaura 4/Chome, Minato-ku, Tokyo 108 Japan. Telex: J22627.

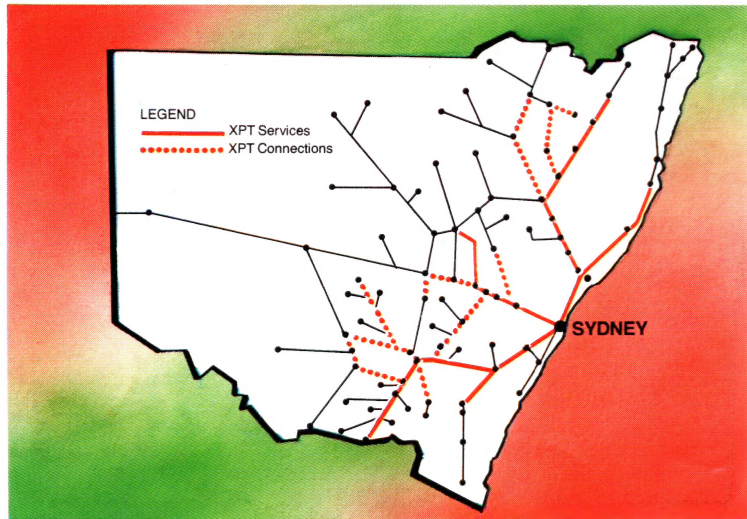


PLESSEY





Comeng XPT



puts SRA on the map!

Country rail travel in New South Wales is undergoing dramatic and spectacular improvement – thanks to the new generation Comeng XPT.

Introducing a new era in air conditioned comfort, passenger luxury and higher acceleration capabilities, power and speed, the high performance Comeng XPT is the equal to anything available *anywhere in the world*. Interior features include floor-to-window sill carpeting, panoramic heat deflecting windows, individual reading lights, adjustable reclining seats and many other modern passenger innovations that puts the Comeng XPT right up front with other modern forms of transport!

And this new generation train was designed, engineered and constructed by Commonwealth Engineering

for the State Rail Authority – convincing proof of the Company's ability to lead the way now – and in the future – for Australia's passenger and freight transport needs.

Winner of the Chartered Institute of Transport Design Award 1981.



Comeng — A division of The ANI Corporation Limited
(Inc. in N.S.W.)
11 Berry St., Granville N.S.W. Phone: 637 0166